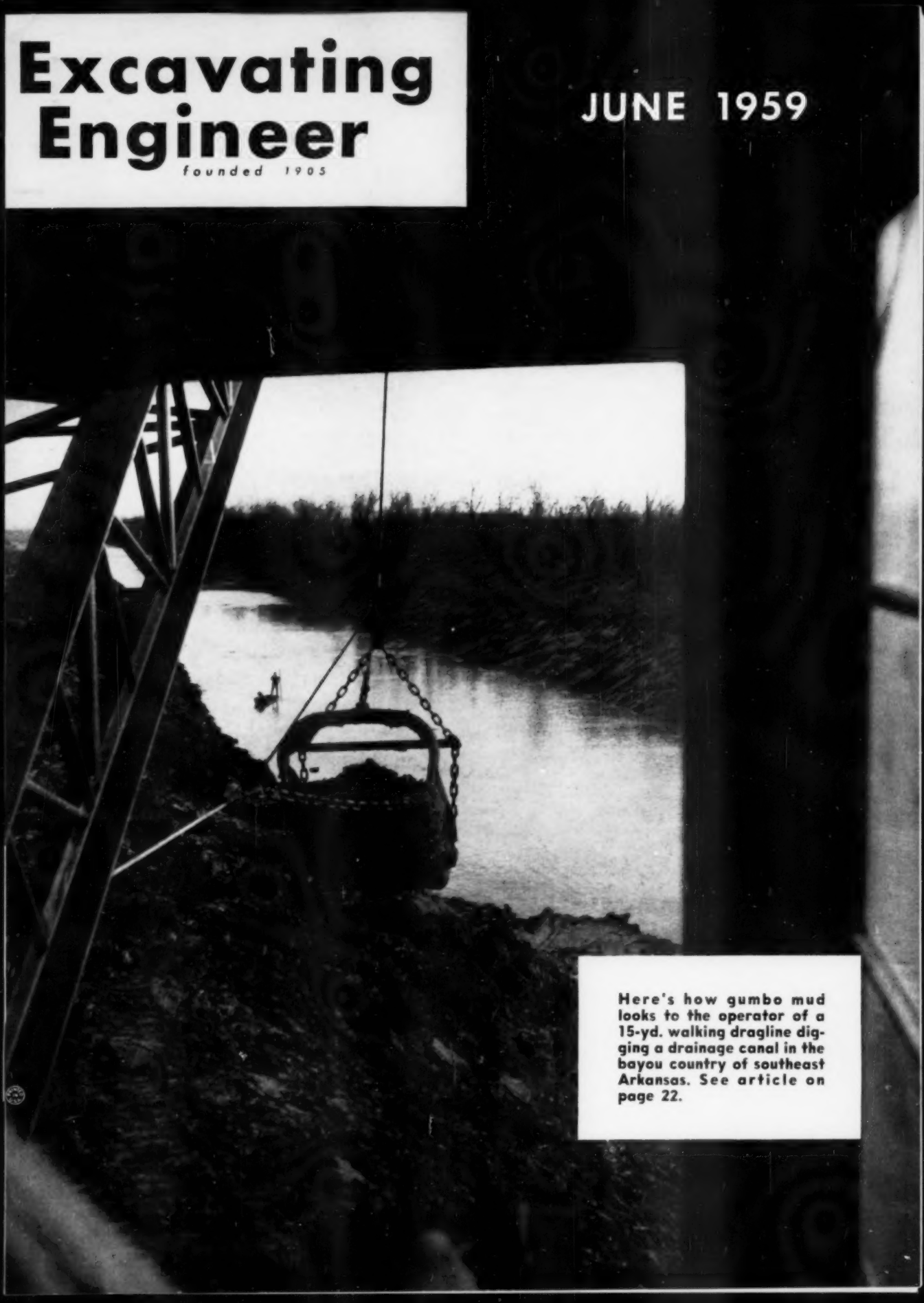
Excavating Engineer

founded 1905

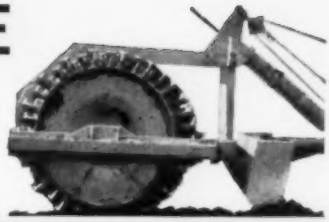
JUNE 1959

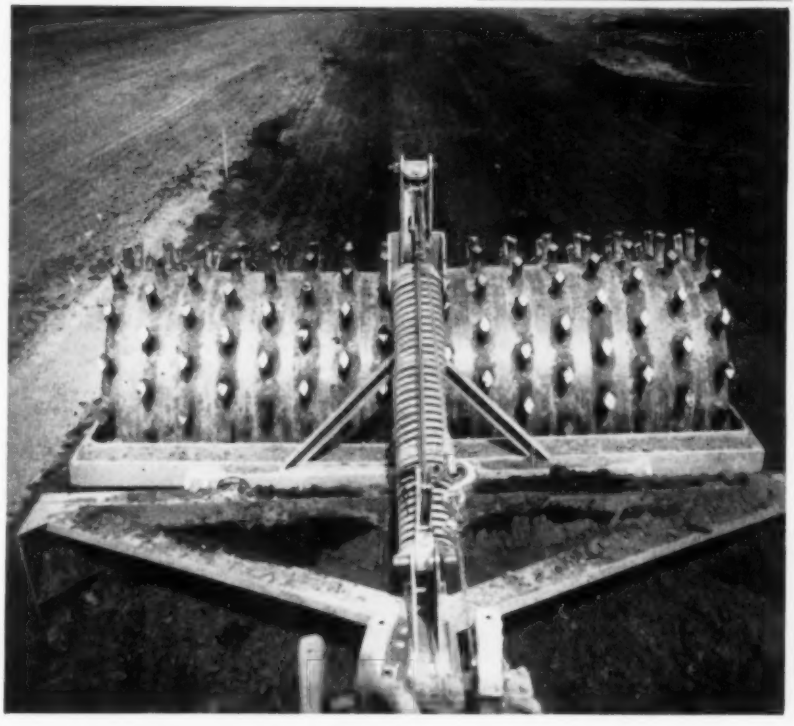


Here's how gumbo mud looks to the operator of a 15-yd. walking dragline digging a drainage canal in the bayou country of southeast Arkansas. See article on page 22.

YOU DON'T WAIT FOR PARTS...
YOU DON'T WAIT FOR SERVICE...
when you own a
BUCYRUS-ERIE!
A $12 million parts supply spread across the U.S. is your insurance against long waits and "will-fit" gap fillers when you own a Bucyrus-Erie!
At more than 80 locations, Original Equipment Specification parts are stocked. No matter where you go, you get service from your Bucyrus-Erie distributor.
In addition, Bucyrus-Erie owners are served by the largest factory service representative organization in the crane-excavator industry. These men will assist you and your Bucyrus-Erie distributor in an emergency.
Sound good? Any Bucyrus-Erie owner will tell you it IS good! Bucyrus-Erie Company, South Milwaukee, Wisconsin.
BUCYRUS ERIE
BUCYRUS ERIE ®
BUILDS BETTER EQUIPMENT

LAST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





The BROS Leveling Tamping Roller* is such an uncomplicated piece of equipment that last year even big grading contractors like Alley Construction Co., of Faribault, Minn. couldn't quite visualize its real value on earthfill work.

But this year, Lloyd Parker, Alley's superintendent on the grading job for nearly a million yards at Wold-Chamberlain Airport in the Twin Cities, put a BROS G2 Roller-Level Blade combination on the job —the results were so good that he purchased a second unit the *very next day!*

You can easily see why: The Leveling Roller makes subgrade rolling a productive item because it produces uniform, proper densities faster than conventional tamping rollers can. The blade puts the materials into the voids, building a smooth, level course, permitting equal compaction pressure over the full width of the drum. Because the course is smooth and compaction is fast, scrapers can haul and spread at faster speeds, earning you greater profits.

The Leveling Blade has 14″ vertical adjustment which is controlled from the operator's seat by either hydraulic or cable control. The Leveling Roller is available in rolling capacities from 15,160 lbs. to 44,700 lbs. when roller drum is filled with wet sand.

*Patent Pending

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112″ width; 24″ height; and ½″ x 6″ double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141″ width; 31″ height; ⅝″ x 8″ square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

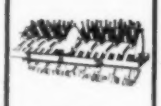
BROS

BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!



SHEEPSFOOT TAMPERS

ROLL-O-PACTOR

BITUMINOUS CIRCULATOR

VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS

Ask your Allis-Chalmers dealer to show you **"And a Great Deal More"**

SINGLE-LEVER speed and direction control makes it easy for operator to work fast

If a loader operator has to move one lever for forward and reverse, and another lever to get into a higher working gear, chances are he's going to stay in low gear.

Recognizing these limitations on your achieving faster loading, Tractomotive developed Single-Lever speed and direction control to speed up the work cycle. It's on the big TL-20 TRACTOLOADER*, the TL-16 and TL-14.

With Single-Lever control, the operator will naturally choose his fastest possible working gear every time he shifts. He can go into second gear just as easily as first—and get there on the double. Moreover, when there's loading to be done down the road or across the pit, he power-shifts right into high (road speed), and does the job in a hurry.

Let your Allis-Chalmers dealer show you how this exclusive One-Lever control of speed and direction alone will add many extra yards to your daily production.

Other TRACTOLOADER working advantages include: Longer Reach; Strong, Pin-Connected Planetary Axles; Extra Stability; Safe Dump Cylinder Location; Extra Hydraulic Protection; Hydraulic Torque Converter Drive; Tip-Back Bucket; "Hi-Traction" Differentials; Power Steering; Ignition Key-Type Starting; 4-Wheel Power Brakes; 6-Way Adjustable Seat; Rear-Axle Disconnect; Bucket Position Indicator.

*TRACTOLOADER is a registered Tractomotive trademark.

ALL TRACTOMOTIVE EQUIPMENT IS SOLD AND SERVICED BY YOUR ALLIS-CHALMERS DEALER

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a sure sign
of modern design

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Excaving Engineer

founded 1905

South Milwaukee, Wisconsin

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Published monthly at South Milwaukee, Wisconsin, U.S.A. Single copy price, 35 cents. Regular subscription (payable in advance) $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscriptions. Indexed by Engineering Index, Inc. Volumes available on microfilm.

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LOWER COSTS
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HENDRIX DRAGLINE BUCKETS

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A lighter weight bucket designed for levee and drainage work

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Unexcelled for Medium-Duty Service

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A heavy-duty bucket for moving shale, gravel and similar formations

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Hendrix Lightweight Dragline Buckets

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LET'S TALK ABOUT EASE

—of shovel and crane operation

It was Northwest that pioneered the movement in the direction of ease of Shovel and Crane operation back in the days when operators had to *stand* at the controls on other machines.

To maintain full day operator efficiency, Northwest engineers developed and pioneered the "Feather-Touch" Clutch Control. This device utilizes the power of the engine to throw the heavy Drum Clutches. Over the years the "Feather-Touch" Clutch Control has been refined and improved to a high point of efficiency.

Here, ease of operation is made possible by a simple, understandable, mechanical device—just a drum and brake band and the necessary linkage —nothing more. It is completely free of complicated and delicate mechanisms. There are no long lines of tubing, no pumps, no compressors or valves—nothing to fill! It is unaffected by weather or temperature and it requires no special knowledge or outside help for adjustment. The action of the clutch is in direct ratio to the movement of the operating lever and the operator does not have to maintain pressure on the operating lever to keep the clutch engaged. It is extremely sensitive and the *true feel of the load* is always present. Release is positive and straight manual control can be introduced at any time.

On a Northwest the operator knows where he is every second of his operating cycle. At once he has smooth, effortless control with freedom from the maintenance problems that come with complicated control devices. This means greater output and greater profit for the contractor. The "Feather-Touch" Clutch Control is pictured in detail in Northwest catalogs. We'll be glad to send you one on the size machine you need.

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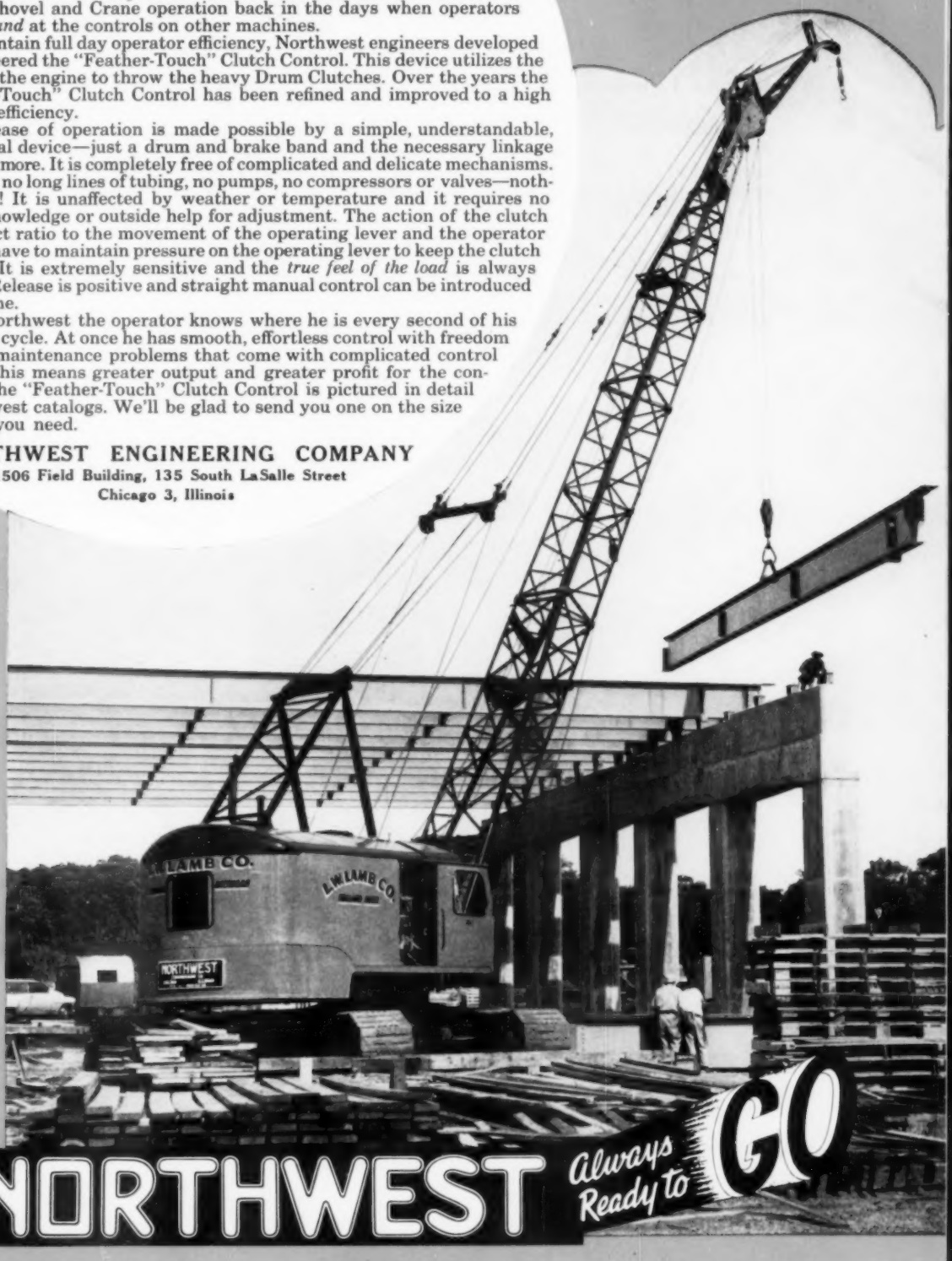

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NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	⅜ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

USS Tiger Brand—America's

—used on Niagara Power Project—

Niagara Falls is the greatest, single natural source of water power in North America. Soon it will be harnessed by the New York State Power Authority to produce 2,190,000 kilowatts of electricity. This is 216,000 more kilowatts than is generated at Grand Coulee Dam, the Free World's No. 1 manufacturer of hydroelectric power.

Water now tumbles over the falls at a rate of 200,000 cubic feet per second. To make use of some of this, two huge intake structures on the Niagara River above the falls will draw water into the power system. (See Map.) This water will pass through about 22,000 feet of twin, covered concrete conduits, feeding into a huge reservoir with a storage capacity of some 20 billion gallons. From the reservoir the water will flow by gravity to an 1840-foot-long power plant built at the base of a 314-foot rock cliff on the Niagara River, below the falls. Here, 13 huge turbine-generators will turn out 1,950,000 kilowatts of electricity. An additional source of power will be the smaller pump-generator station at the reservoir, generating up to 240,000 kilowatts. Shovels and bulldozers rigged with USS Tiger Brand Wire Rope are busy

No. 1 Wire Rope

biggest in the country

chewing away the rocky cliff to make room for the power house.

Why Tiger Brand is your best buy

1. It is made by a company that maintains the most complete wire rope research and manufacturing facilities in the country.
2. It is designed by one of the country's largest staffs of wire rope engineers. It is serviced by thoroughly experienced field representatives always ready with their assistance.
3. Every type of Tiger Brand Wire Rope is designed for specific applications. You get the *right* rope for the job.
4. It is made by *one* company, U. S. Steel, and every step of production, from ore to finished product, is carefully controlled and supervised to guarantee *one* high standard of quality.
5. Tiger Brand Wire Rope is manufactured by the largest single producer in the country.

For complete information, write to American Steel & Wire, Dept. 921, 614 Superior Avenue, N.W., Cleveland 13, Ohio.

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Division of
United States Steel

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Main generating plant of the Niagara Falls Power Project, one of the world's largest, will produce 1,950,000 kilowatts of electricity.

Ripping rock—USS Tiger Brand Wire Rope is used throughout this shovel and on many of the other draglines, cranes and bulldozers digging the excavation for the main power plant.

Engineering Consultants:
Uhl, Hall and Rich—Boston

General Contractors:

Merritt Chapman & Scott—
$98,288,498 Niagara Power Plant and $65,692,254 Niagara River Intake Works, plus 6600-foot section of the waterway.

Ball-Savin-Winkelman—
$37,366,805 Section II of the waterway.

Gull-Defeliee—
$29,861,840 Section III of the waterway.

Tuscarora Contractors—
Combine of Arundel Corporation, Sponsor
L. E. Dixon Company,
Hunkin-Conkey Construction Company,
$39,834,292 Tuscarora Power Plant.

Channel Constructors—
Peter Kiewit, Sponsor
Perini Corporation
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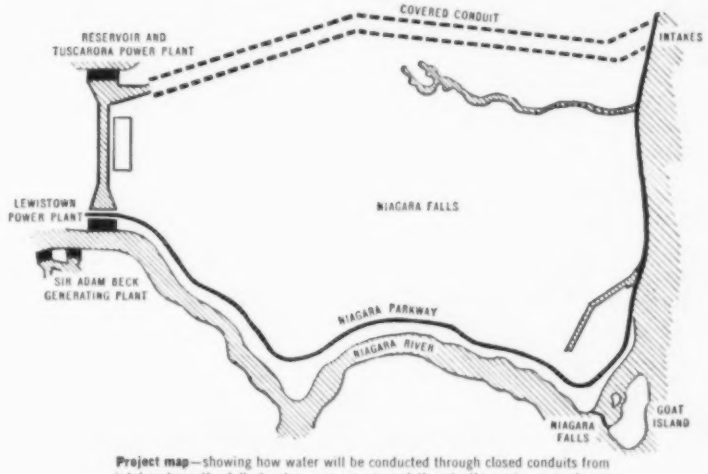
Walsh Construction Company
$31,855,000 Section IV of the waterway, plus Aggregate Plant.



Project map—showing how water will be conducted through closed conduits from intake above the falls to storage reservoir and then to the main power house below the falls. The two power plants will generate 2.19 million kilowatts of electricity—enough for the household needs of a city the size of Chicago.

FOR CONTINUOUS SERVICE IN HEAVY DIGGING

MARION 181-M

The new levels of output and efficiency made possible on operations that can use large haulage units make the Marion 181-M a logical machine for expanded pit mining operations.

Here's a husky 8-yard machine with the traditional strength, power and endurance of Marion mining shovels - - plus small machine cycle time for an extra payoff every day.

With low-maintenance Ward-Leonard controls, power is applied smoothy and quickly, yet held within controlled limits that safeguard the machine against undue shocks or strains.

The chain propel simplifies crawler design and provides increased protection for the final propel mechanism, especially on shovels where the drive chain is enclosed and dips in oil.

A disc-type air clutch permits the operator to engage the travel mechanism without stopping the machinery, permitting faster move-ups.

If you haven't seen Bulletin 439 on this 8-yard Marion, write for your copy today.

CONSULT **MARION** *MINING SPECIALISTS*

for lowest costs on your property!

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A Division of Universal Marion Corporation

dozer
1917 MODEL
Make: Frazier-Davis Construction Co.

dozer
1959 MODEL
Make: Eimco 105

THE BIG E THE MODERN BULLDOZER...

Only forty-two years ago, this two mule-power dozer was in operation for the Frazier-Davis Construction Company of St. Louis, handling final clean-up and grading for the intake chamber on the Missouri River development of the St. Louis Water Works at Hine, Mo. The blade up ahead was rotated over the axle, so to get more weight on the blade, the operator simply walked forward. To raise the blade, he stepped to the rear.

What a difference today . . . **If** the dozer you are comparing is the modern Eimco 105! Because even today, most other tractors **still** have the operator at the wrong end of his horsepower . . nearly as far away from the blade and his work as he was in 1917!

Only the Eimco 105 puts the operator up front, where he belongs . . . where he can see what he's doing. See his work. See stumps and obstacles. Guide and work his tractor efficiently and with less fatigue for more work output, greater safety and control. All this, plus famous Eimco rugged construction, easy maneuverability, greater stamina and more efficient and effective utilization of power through Eimco's unique power-team of modern engine - torque converter - Unidrive - Dual Final Drives.

You can't know what a **really modern** tractor can do for you unless you have job-tested the Eimco 105. Call any Eimco branch for a demonstration on your own job-site . . . or write The Eimco Corporation P. O. Box 300, Salt Lake City 10, Utah for specifications and all the facts of modern tractor design and engineering.

"Advanced Engineering and Quality Craftsmanship Since 1884"

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TWIN-POWER CRAWLER

S-18
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TS-24
"TWIN" SCRAPER

BIG POWER . . . BIG CAPACITY . . . BIG PERFORMANCE !

your best bet to beat the profit squeeze

Two engines deliver 425 net h.p. to power trains . . . separate Torqmatic Drives and full power shift . . . independent track drives . . . 27" standard shoes . . . 8 track rollers . . . excellent accessibility.

30 yds. heaped . . . 336 h.p. engine . . . 4 speed Torqmatic Drive with converter lock-up . . . independent hydraulic controls for bowl, apron and ejector . . . 27.00 x 33 tires with 33.5 x 33 optional.

Two engines with a total of well over 500 h.p. . . . separate Torqmatic Drives . . . 24 yds. struck . . . 32 yds. heaped . . . NoSpin differentials . . . all wheel drive . . . unequalled grade-ability.

WITH COSTS still on the rise, obsolete methods and machines don't help your competitive position or your profit picture . . . can cost you jobs and money. To get your share of work . . . at prices that bring a good return on investment . . . equipment has to produce more without increasing costs. Modern earth-moving techniques and big machines can make the difference between a problem and a decent profit.

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EUCLID Division of General Motors, Cleveland 17, Ohio

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

A welder caused us to caucus

The note from an employee suggestion box read "How come a company like this hasn't got the U. S. Savings Bond Payroll Savings Plan". It was signed by a welder in the fabricating department.

Since we actually *do* have Payroll Savings this told us two things: (1) Probably more employees than we imagined wanted the advantage of buying U. S. Bonds automatically through Payroll Savings. (2) We had grown lax in bringing our Plan to their attention.

But what to do? The solution was simplicity itself.

We called in our State Savings Bonds Director. He provided all the promotional materials needed to arouse interest in U. S. Savings Bonds. Then he helped to conduct a personal canvass and place an application blank in everyone's hands.

The results were amazing. Employee participation shot up to a percentage that we could take pride in. There was no "hard selling", nor was work interrupted. Our people wanted the security U. S. Savings Bonds offer them.

Today there are more Payroll savers than ever before in peacetime. Your State Director will be happy to help you install a Payroll Savings Plan or build enrollment in one already existing. Look him up in the phone book or write: Savings Bonds Division, U. S. Treasury Dept., Washington, D. C.

EXCAVATING ENGINEER

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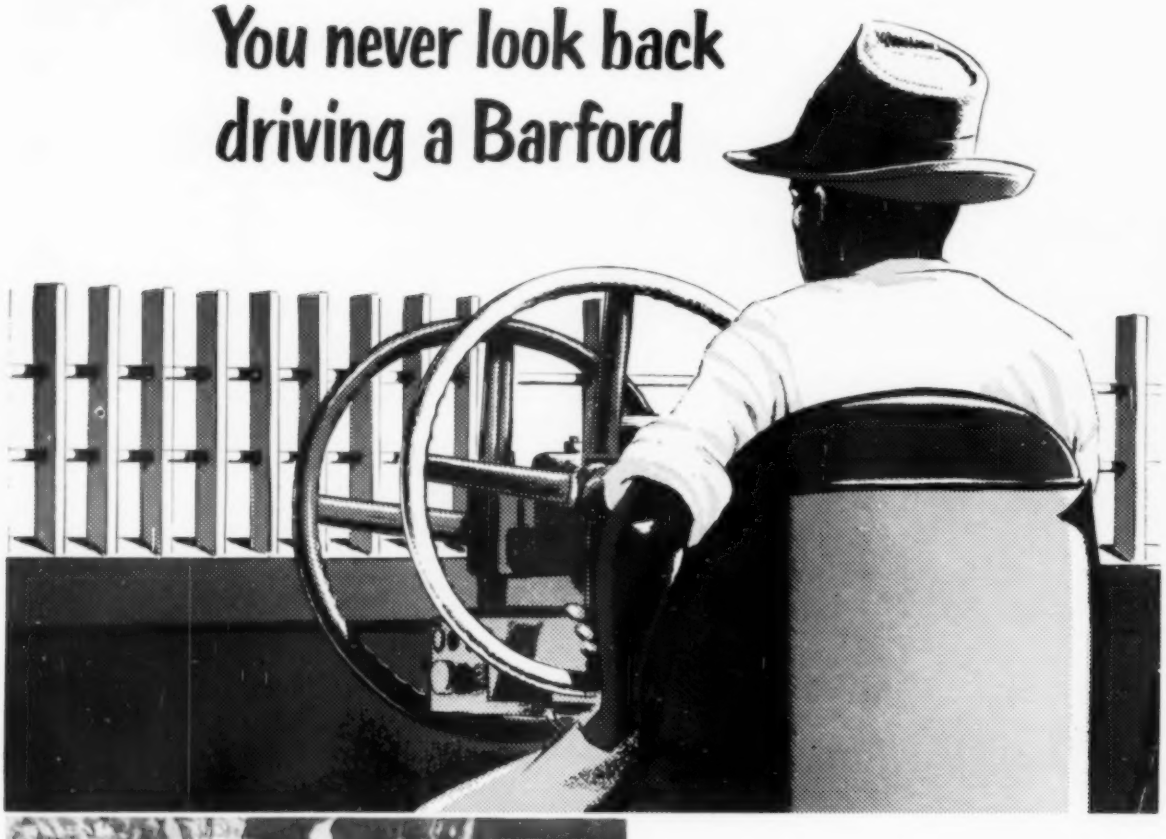
H&L **TOOTH COMPANY**

1540 SOUTH GREENWOOD AVE. MONTEBELLO, CALIFORNIA

SPECIALIZING IN TWO PART TEETH FOR OVER 28 YEARS

You never look back driving a Barford

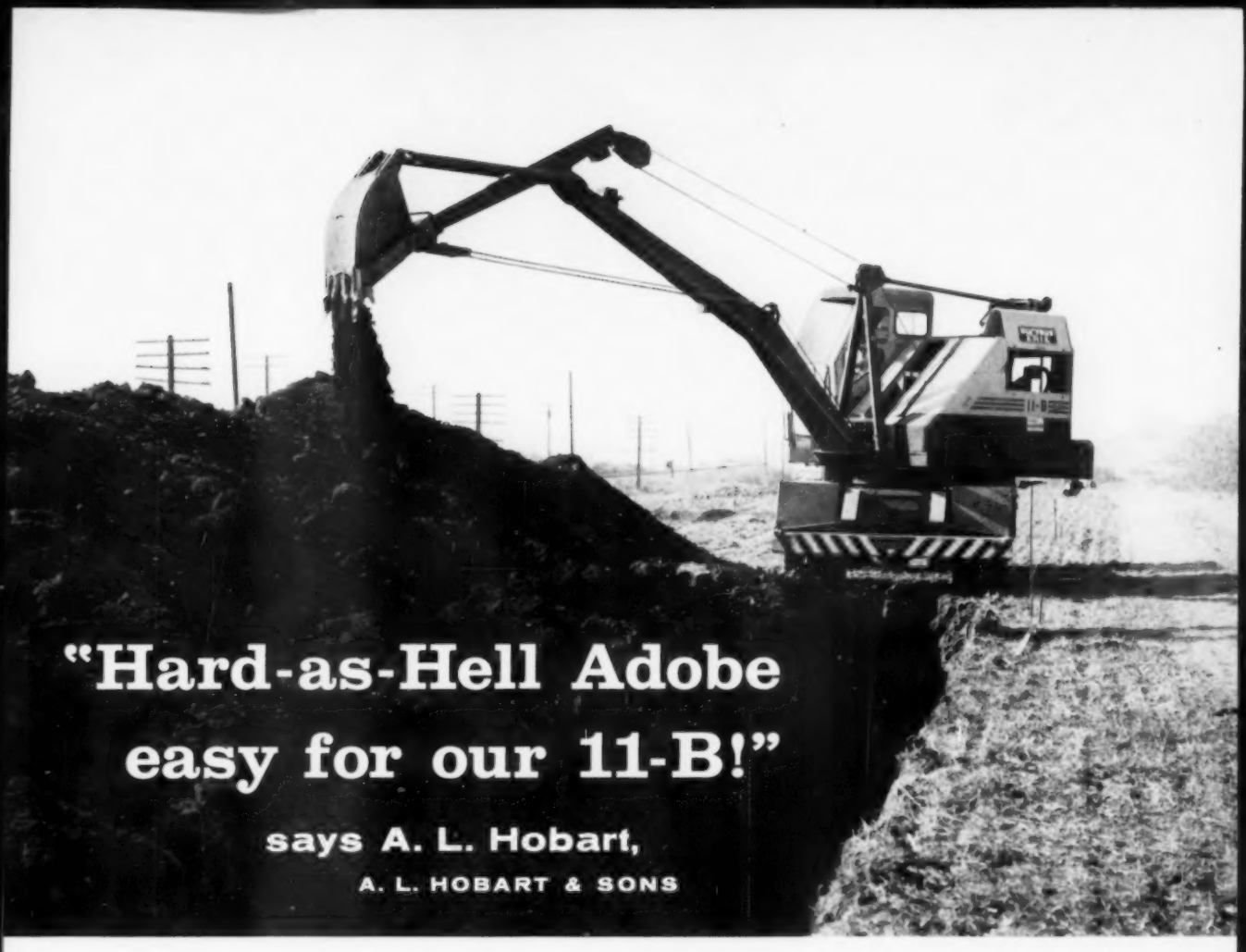


Two-way steering allows the driver of a Barford dumper to operate more easily and quickly. Other features which also help towards more work at lower cost include multi-speeds both forward and reverse, fast hydraulic tipping mechanisms, duplicated but independent braking systems, etc. Barford Dumpers range from 3 cu. yd. to 27 ton capacity.

Barford

DUMPERS

AVELING-BARFORD LIMITED · GRANTHAM · ENGLAND · *Originators and world's largest makers of road rollers*



"Hard-as-Hell Adobe easy for our 11-B!"

says A. L. Hobart,

A. L. HOBART & SONS

Hobart averaged 200 lineal feet of 12-ft-deep, 5½-ft-wide trench every 8-hr shift on this pipeline relocation job near Walnut, California, digging in "hard-as-hell adobe!"

Hobart's reaction to the new Bucyrus-Erie 11-B is typical, and here are more reasons why:

The 11-B hoe has the extra range owners have needed so long — digs 17 feet down . . . reaches out 26 feet, 9 inches to put dirt farther away from the trench, loads trucks easily, makes fewer moves per day.

The 11-B's exclusive, variable pitch dipper action gives you as much as 10% more level floor, changes the pitch of the dipper continually as you dig.

Easy to maintain? The 11-B has more time- and energy-saving maintenance features than any other crane in its class, including a color-guide lube system, automatic gear lubrication, pre-lubricated ball bearing swing circle with nothing to adjust, no bushings to replace.

Get the complete 11-B story from your distributor, or write Bucyrus-Erie Company, South Milwaukee, Wisconsin, Dept. 22-EA.

BUCYRUS ERIE®

Builds Better Equipment

Ouija boards are passé

Time was, when a person had a question, out would come the ouija board for an answer. This wasn't too accurate a system, of course . . . but a lot of people put a lot of faith in what the ouija board told them.

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- **Advertising that will *have value to you***

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no one makes a tougher tooth than ESCO

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The construction industry looks to

Electric Steel Foundry Co., PORTLAND, OREGON

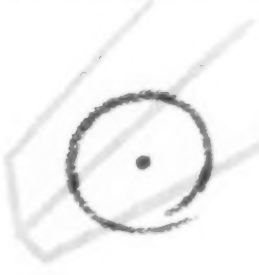
See reverse for shapes and size range

Here are the points to remember...

12M ALLOY STEEL

ESCO 12M Points are the toughest you can buy. Developed through years of research for the construction industry, cast *ESCO* 12M is carefully heat treated to produce the finest steel made for the severe shock and abrasion encountered by points and adapters.

RIGID QUALITY CONTROL TESTS ASSURE TOUGHNESS, HARDNESS



Every *ESCO* Point is Brinell tested to assure the exact degree of shock-absorbing toughness and abrasion-resisting hardness for longer digging life. Be sure to look for the Brinell mark on every *ESCO* Point you buy.

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You can select from eight different shapes to find the point that matches your digging conditions. *ESCO* Points are designed by bucket and excavation specialists who know how to achieve top digging performance. The self sharpening design of an *ESCO* Point makes it start sharp and stay sharp.

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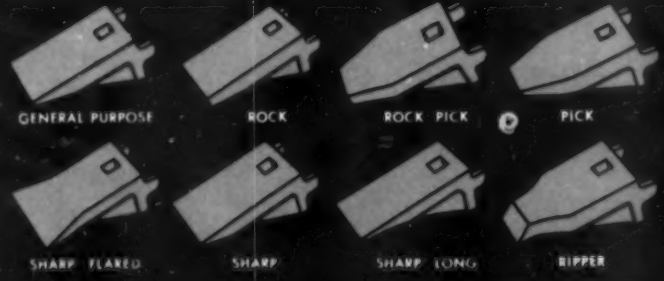

ESCO Point shapes start sharp, stay sharp and last longer under any digging condition

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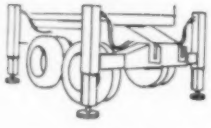
It will lift 24,000 pounds. Its outriggers  operate hydraulically and individually — within seconds to keep you level when you work. The controls are hydraulic — oil-smooth. The boom on a Hydrocrane is telescoping. You can add 12 feet to your reach *on the move*, without stopping! The standard boom can be 24 to 36 feet long, the high lift boom can be 38 to 50 feet long — or even 70 feet long with the jib! The Hydrocrane travels over streets, highways, in plant yards as easily and fast as your pickup trucks. Does it work? It works so well that over 50% of the customers* who have ever bought a Hydrocrane, have bought another!

*Who are they? They're steel erectors, contractors and loggers. They're municipalities, utility companies, precast concrete people. And, there are many more every day. **See your Hydrocrane distributor for a free demonstration,** or write Dept. 15HB, Bucyrus-Erie Company, South Milwaukee, Wisconsin.

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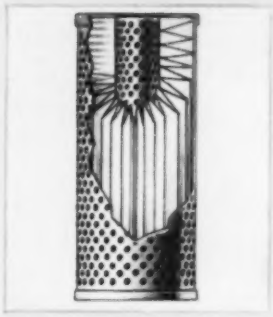
SPECIAL REPORT TO CATERPILLAR OWNERS:

CAT CATERPILLAR

Parts you can trust
Dependable round-the-clock service

CUT MAINTENANCE COSTS...EXTEND EQUIPMENT LIFE BY CHANGING OIL AND FILTERS AS RECOMMENDED



How often should lube oil and filters be changed? The answer is obvious—when the lube oil and filter can no longer do their jobs. But how do you know when that time comes? Can you afford to guess?

Guessing can be costly. The cost of oil changed *more frequently* than necessary adds up to big sums during a work season. *Delayed* oil changes can bring about premature overhauls with more parts replacement costs.

Manufacturer recommendations are based on sound principles. Rapid advancements have been made in perfecting "additive" lube oils that can reduce wear. The familiar ridge left in liners by the piston rings can be practically eliminated by the use of Series III Oils and proper maintenance practices! These oils also allow longer periods between changes.

Full benefit and savings from new oils cannot be had without proper filtering. Caterpillar Engines have an emergency by-pass valve that opens and allows unfiltered oil to circulate if the elements become clogged. And elements become clogged when their dirt-holding capacity is reached. Caterpillar elements have ample dirt-holding capacity to keep the by-pass *closed* over the recommended period.

But aren't the dirt-holding capacities of all makes of filters about the same? To protect the long life reputation of Cat Diesel Engines, Caterpillar continually tests all brands of elements offered for Cat Engines. Below are the *surprising* results, based on tests of filters purchased on the open market during 1957 and 1958. During these tests commercial test dust was gradually added to clean oil until each filter clogged and the emergency by-pass valve opened. The amount of dirt added is recorded in the "Sediment Index" column.

HOW CAT FILTERS COMPARE WITH OTHER BRANDS

Brand	Filtering Area (Square Inches)	Sediment Index (In Grams)	Comparison
CATERPILLAR	1450	75	Used as basis for recommended oil and element change periods.
BRAND A	1450	13	Cat element lasted nearly 6 times longer.
BRAND B	1170	22	Cat element lasted 3 times longer.
BRAND C	1000	34	Cat element lasted more than twice as long.
BRAND D	Not measurable*	No oil flow	Opens by-pass immediately even when new.
BRAND E	1450	26	Cat element lasted nearly 3 times longer.

SERVICE TIP: Get your copy of "Crankcase Lubricating Oil Change Recommendations," Form 32421-1W, from your Caterpillar Dealer right away. Keep pace with the new lube oil developments.

Your Caterpillar Dealer has the complete story on the advantages of changing lube oil and filters as recommended. Ask him to figure your annual engine oil costs for you, and see how much you can save. See him today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Excavating Engineer
founded 1905 JUNE 1959

Kenyon's 480-W walking dragline widens and deepens a drainage ditch, spoiling material on bank. Boom length is 160 feet.

Mississippi Delta's Biggest Modern Dragline Digs Bayou Channel

Cleaning and widening of drainage canal in bayou district is sticky job for 15-yd. bucket of 480-W walker. Work is part of plan to dewater thousands of acres of potentially rich lands.

by L. H. Houck

DISTINCTION of owning the largest modern diesel-powered walking dragline in the Mississippi Delta region is held by Kenyon Construction Corp., Port Allen, La.

Kenyon recently demonstrated the digging ability of its new Bucyrus-Erie 480-W on a channel deepening and widening project in the bayou country of southeast Arkansas close to the Louisiana state line.

The big walker, costing close to three-quarter million dollars and weighing about 750 tons, carries a 15-yd. bucket on a 160-ft. long boom.

The Kenyon firm is dredging about 21 miles of Canal No. 19, which is a major drainage channel in Lincoln and Desha counties of Arkansas. The job lies to the east and roughly paralleling U. S. highway 65 between Pine Bluff and McGehee, Ark.

Excavation generally runs between 6,000 and 12,000 yards per station and all material is piled to one side or the other of the existing drainage ditch.

The Canal No. 19 job—Corps of Engineers contract DA-22-052-CIVENG-58-427—was awarded by the Vicksburg (Miss.) District on March 10, 1958 to Kenyon Dredging Co., Port Allen, parent company of Kenyon Construction Corp. The subsidiary is performing the actual work under subcontract. Both companies are headed by Howard Kenyon, Jr., president. A completion time of 750 calendar days is allowed by the contract.

Contract price is $357,200, and the quantity involved is approximately 4,700,000 cubic yards of excavation—mostly gumbo mud with a high water content.

The Kenyon contract is in the upper

Allis-Chalmers HD-16 and HD-21 dozers level the top of the spoil pile for an access road along the drainage channel.

portion of the Bouef-Tensas rivers drainage project, purpose of which is protection of wood and agricultural lands from disastrous flooding. The overall Bouef-Tensas improvement area covers 5,300 square miles of rich alluvial valley land in Arkansas and Louisiana. This basin to be drained and flood-proofed has an overall length of 190 miles in a generally north-south direction and has a width of about 30 miles.

Improvements are being made with funds provided by Congress. Aggregate length of authorized work in the basin is 853 miles. Total cost is estimated at $21.7 million.

The general history of the basin is interesting in the face of improvements now nearing completion.

While this particular area is protected from the Mississippi and Arkansas Rivers by levees, it is subject to river overflow at the lower end of the basin by the Ouachita, Mississippi and Red rivers.

Existing protection is provided by the South Bank Arkansas River levee and the connecting West Bank main-line Mississippi River levee.

The basin is protected from Ouachita River floods by the east bank Ouachita River levee which extends from high ground near Bastrop, La., downstream to near the mouth of the Boeuf River.

Interior Drainage

This leaves the lower end of the basin subject to disastrous backwater overflow. Interior drainage within the basin must be carried through a complex system of waterways that empty eventually into the Ouachita through the Boeuf and Tensas.

Prior to 1920, Old Cypress Creek Gap—a two-mile gap in the levee system between the lower end of the then existing Arkansas River levee and the Mississippi River levee opposite Rohwer, Ark.—afforded a drainage outlet for Cypress Creek, which flowed easterly across the upper end of the basin. A

Teeth of the big 15-yd. BM bucket leave deep impressions on the soft bank as the dragline carefully cuts a 1 on 2 side slope.

This is how the 27,000-lb. bucket looks closeup. Knockout chains fastened to the floor help unload the wet sticky mass.

levee was completed across Cypress Creek in 1920-21 by local interests. Locally-organized drainage districts constructed Canals 19, 43, and 81. These waterways head the basin drainage system.

It was soon evident, however, that local drainage districts could not cope with so large a problem and that drainage and flood control had to be considered on a scale that would include the entire valley.

Recommendations made by the Corps of Engineers, U. S. Army, after a long and painstaking study of the complex problems of the area, resulted in authorization of the various project phases in Congressional acts passed in 1944, 1946, 1950 and 1958.

Project Benefits

When the complex task of excavating drainage canals is completed, these impressive results will accrue:

Flood control and drainage benefits will be provided for 856,000 acres of valuable agricultural land, of which 293,000 acres have been cleared.

Woodlands totaling 275,000 acres will be cleared to become cropland.

The annual toll of flood damage amounting to $648,000 will be saved.

Productivity of cleared land will be increased by $2,753,000 yearly.

Annual production from drained and flood protected land yet to be cleared, is conservatively estimated at $2,430,000.

When the federal government's 1959 fiscal year began on July 1, 1958, some 420 miles of improvements had been completed at a cost of $13 million. By the end of 1958, another 100 miles were added to the completion total.

Construction-wise, the clearing and excavating of new flood channels involves some of the contrariest terrain and the stickiest gumbo to be found anywhere, taxing the ingenuity of contractor personnel and the stamina of equipment.

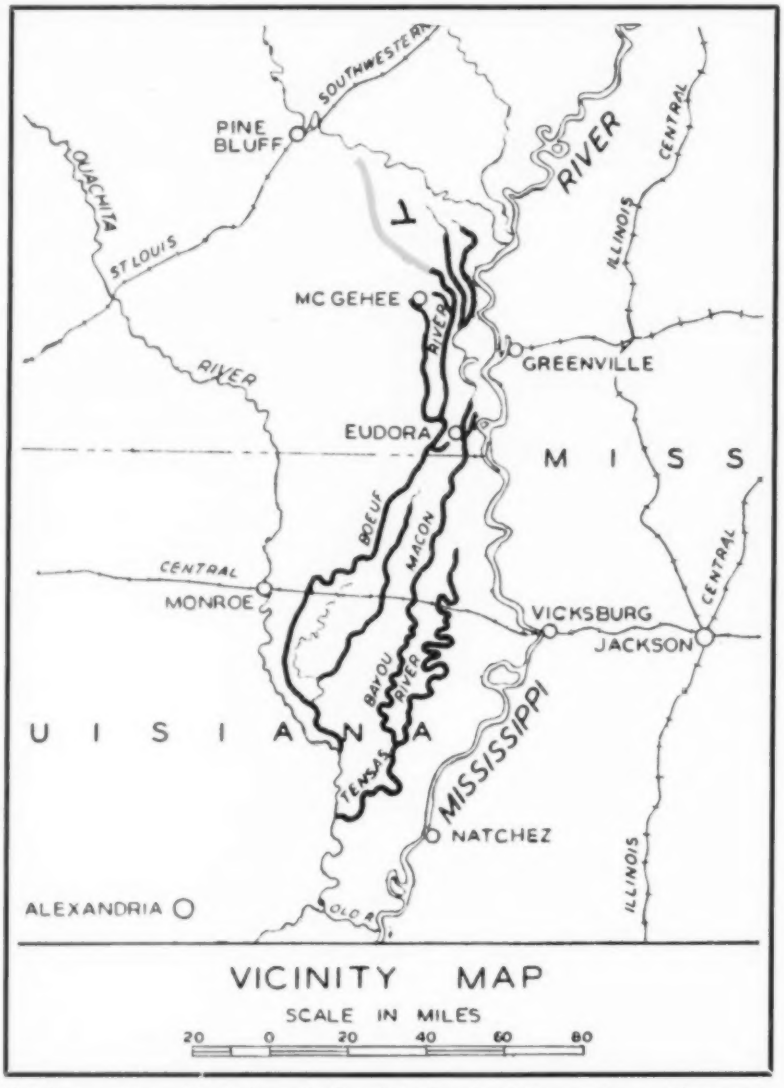
The region is plagued with rubbery bogs, quicksand, gumbo and clays with kaleidescopic characters that change with the weather.

For instance, more than a hundred years ago, the tight sub-soil in many places was recognized as ideal rice land because of its ability to hold water which periodically overflowed from the Mississippi, the Arkansas and other streams. Since then, Arkansas has become one of the leading producers of commercial rice, along with Louisiana and several other states.

Geological History

Although the water-retaining ability of the soil was good for rice, it did not especially cooperate with contractors who wanted to scoop it up and move it. And the natural composition of the soil presented other obstacles to modern excavation methods. According to geological history, the Arkansas Valley trough was subjected for millions of years to the encroaching and receding seas. It was out of the reach of the glaciers that came down from the north in the Ice Age.

These sea waters accumulated the



Vicinity map shows the drainage basins of the Bouef and Tensas rivers, which empty into the Ouchita River. Color line (top) shows limits of Kenyon's Canal No. 19 job.

Jesse Prewitt, superintendent for Kenyon Construction Co. inspects a tape made by an automatic device which records the number of swings made by the dragline. Note terrain over which the 480-W travels—enough to stick the average truck.

other excavating jobs, placed an order for fabrication of a modern larger 480-W dragline.

This new machine was shipped to Tillar, Ark., with two Bucyrus-Erie buckets—one a 14-yd. and the other a 15-yd. After being unloaded from 37 freight cars, the dragline was erected, and it walked three miles to the site of Canal 19. It started to work in August 1958.

Prior to putting the 480-W to work, Kenyon had done pioneer clearing along the canal.

Trees were cut by hand labor using chain saws. Two Allis-Chalmers crawler tractors with Twin Disc torque converters were put on clean-up. An HD-16 with a Kushner cutting blade helped with the roots and debris; an HD-21 dozed off the top of the east spoil bank of the old canal forming a working base for the incoming 480-W walker.

Next step was to run in a crawler-mounted Bucyrus-Erie 71-B dragline using a long-reach 110-ft. boom and a 1½-yd. clamshell bucket. It proved ideal for piling uprooted trees and some pioneer channel cleaning.

Soft Footing

Big question, of course, was whether or not the big 750-ton walking dragline could operate off the muddy spoil bank without use of mats. If matting could be avoided, the rate of movement would be materially increased.

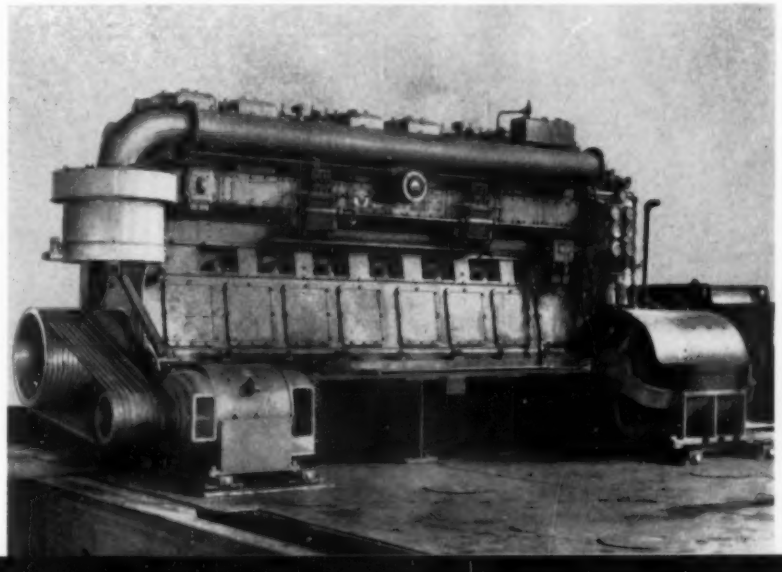
The 480-W soon showed that ground pressure was widely and evenly distributed over the machine's broad circular base so that additional support was unnecessary.

Three shifts of expert operators, each working 56 hours per week, filled out the 24-hour day for the big machine. Swing recorder tapes soon showed 5 and 6 dig-

sediments of the land surface of today—the limestones, sandstones, shales, sands, clays and chalks. There is an abundance of dark, slick, slimy shale created by eons of decaying vegetation.

All the difficulties in the book face the excavation contractor. Some of the material digs well when dry, other sections dig when wet—not a pleasant task to face for the contractor who must dig throughout the four seasons.

About two years prior to awarding of the Canal 19 contract, Kenyon, already the owner of an old Bucyrus-Monighan 6160 walking dragline which it used in



480-W walker is powered by this 8-cylinder, 1,000-hp Cooper-Bessemer diesel.

ging cycles for each 5-minute interval for the longest reaches and 7 to 8 cycles per five minutes on the shorter swings.

Average normal 24-hour production was 18,000 yards, with a top potential of much more. This speed put the job ahead of schedule almost from the start.

The happy combination of a big capacity machine, expert operators and top flight supervision seems to have furnished the answer to stubborn excavation.

Slippery mud almost constant throughout the winter, proved no insurmountable obstacle to the walker's ready ability to move. It worked steadily at the rate of 24 hours per day throughout the winter and, in one instance, worked through a torrential downpour that lasted 24 hours.

"Our confidence in the big machine was materially increased when it worked and walked through a 6-in. rainfall without the use of mats," said Supt. Jesse Prewitt. "Even with slippery banks, we worked at top production all winter."

Shapes Banks

Bank slopes and bottoms were excavated by the 480-W with virtually no revision required. Sections excavated consisted of channel with a 90-ft. wide bottom and 1 on 2 side slopes at the start of the job near Tillar, followed by 8.6 miles with a 70-ft. wide bottom and an upper 5.9 miles with a 30-ft. wide bottom.

When visited by *Excavating Engineer*, the work was progressing in the vicinity of Dumas, Ark., on the 70-ft. bottom sections.

Getting crews to the job from existing highways proved almost as tough a problem as excavation in some areas where several miles of almost impassable gumbo separated the canal from the highway.

Col. M. Barschdorf, USA, is engineer of the Vicksburg (Miss.) district of the Corps of Engineers, which is supervising the Kenyon Construction Corp. project.

In most cases crews were transported in four-wheel drive vehicles, such as an International pickup truck which was a unit of the Kenyon fleet. In some cases this vehicle could not negotiate the terrain, and crews turned to the use of an army weasel which had flexible belt drives. Other trucks in the contractor's fleet consisted of a Ford F-100 pickup; another International pickup without four-wheel drive but equipped with automatic transmission; and a 1½-ton Ford truck.

The power source on the 480-W walker is an 8-cylinder, 1,000-hp naturally aspirated Cooper-Bessemer diesel engine, governed at 500 rpm and starting on air.

Fuel oil used was Texaco 445 No. 1 and lubricating oil was 40-W Havoline. About 750 gallons of diesel fuel oil were consumed during a 24-hour day.

The hoist and drag drums are driven through Bucyrus-Erie direct-connected transmission and a Fawick clutch. The swing is electrically powered through a General Electric motor. Control is electric over air, with electric controls operating Magnavalves on hoist, drag, brake and walking device.

Switchboard is General Electric and a 250-volt, 340-ampere General Electric generator is driven from the crankshaft of the Cooper-Bessemer by 14 V-belts. From the other end of the main shaft, V-belts drive a General Electric 125-volt, 480-ampere exciter.

A Gardner-Denver ADR-1011 air compressor, belt-connected to the main shaft, furnishes make-up starting air and air for controls at 125 psi. For starting on empty tanks, a model ADD-1011 Gardner-Denver air compressor located in the engine room is independently operated by a direct-connected Waukesha gasoline engine.

Rochester wire rope is used in 2-in. diameter size for the hoist and 2½-in. diameter for the drag.

Ahead of Schedule

When visited by *Excavating Engineer* in spring, the job was one year old. The contract allowed 750 days for completion and the job was easily six months ahead of schedule.

The job is under the direct supervision of the Vicksburg District of the Corps of Engineers, U. S. Army. Col. M. Barschdorf is district engineer.

Kenyon Construction Corp., is headed by Howard Kenyon, Jr., president.

Representing Kenyon on the job was Jesse Prewitt, general superintendent, and Fred Tomlinson, engineer for Kenyon.

View of a completed section of Canal 19 project shows the new 70-ft. bottom width channel compared to narrow old width.

Shock - Wave Technique Reveals Subsurface Conditions

by C. R. Fahnestock
Sales Development Section
Caterpillar Tractor Co.,
Peoria, Ill.

Subsurface analysis of a highway cut starts with the strike of the hammer against a steel plate on the ground. The shock wave travels underground to the geophone and its electronic counter. The test crew measures off the distance from the impact plate to the geophone. Travel time for the shock wave is measured by the counter.

Seismic analysis process tells highway contractors whether roadway cuts can be successfully handled by ripper-scraper excavation. Several Cat dealers are currently demonstrating it.

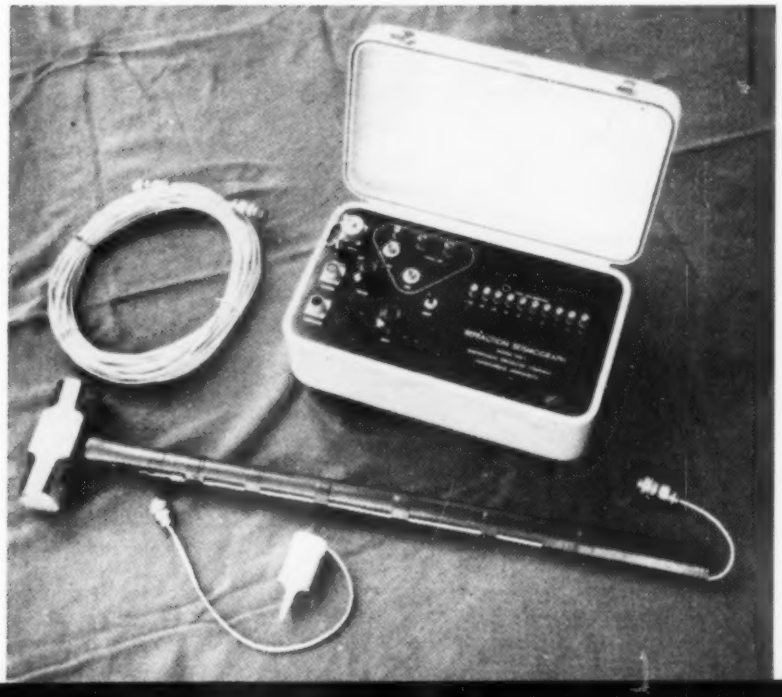
TWO men stopped on top of a hill. One opened up a small traveling case containing instruments. The other slammed the ground with a heavy sledge. After every blow of the hammer, lights flashed inside the instrument case. A few minutes later the two men had located shale 20 feet underground. Contractor Ed Jones learned from this simple technique that he could handle this highway cut easily with rippers and scrapers.

Ed Jones is a shrewd contractor. He likes to tackle big, tough earthmoving projects, and he rarely loses money on his jobs. He runs a well-equipped and well-rounded fleet, backed by competent personnel. And Ed knows his costs of operation. He knows, for instance, that costs skyrocket when he has to pull off his rippers and fast-loading scrapers and turn to blasting.

Jones was one of the first contractors in this area to turn to ripping and scraper loading for rocky materials. His crew slashed excavation costs first with the towed rippers, then later with the hydraulic rippers integrally mounted on heavier, more powerful crawlers. Now with a complete range of equipment available, Jones' crew can handle any material in the quickest, most economical method, whether it be ripping or blasting.

Accuracy Necessary

Training and long experience have enabled Jones to estimate costs accurately. He walks the job, checks core drillings taken by the highway department, sometimes makes his own tests. Even so, he frequently runs into highway cuts that irritate his ulcer. Hard



Equipment used in the seismic analysis process is light and simple. Main instruments are a geophone, which receives the sound waves created by sledge-hammer blows, and an electronic counter.

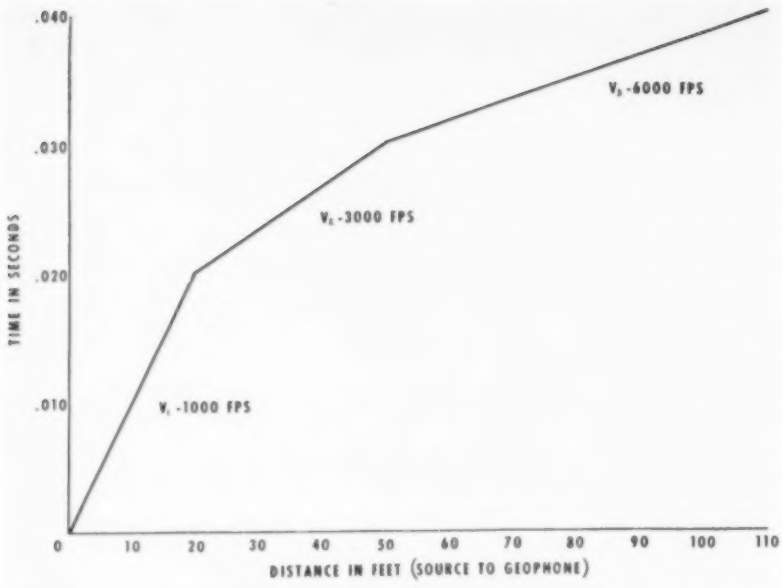


Figure 1. To interpret geophone findings, the time and distance are plotted on a graph, with distance in feet plotted along the bottom and time in units of milliseconds plotted up the side. Points fall in line for each type of material encountered since shock wave velocities are the same for material of similar consolidation. Straight lines drawn through adjacent points in this graph show three types of material.

rock shows up where he had hoped to find softer material. He often wonders when he bids: How much of this material can be ripped? What equipment will be needed? How should it be used?

When these questions still stand after checking the job, he must make a guess, based partly upon what he knows, partly upon what he thinks, and partly upon what he expects competitors to do. Sometimes he can rip more than he expected and he makes a little more profit than he had hoped for. Too frequently he can't rip as much, and when competition has forced the bid down it takes several lucky bids to break even.

But recently he heard about a new process to take this guesswork out of his bid. This new process, called seismic analysis, makes it possible to determine how much of the material in a cut can be ripped.

A contractor he knows in Pennsylvania had lost a $1¼ million contract by less than $5,000—the bid price included a guess that some of the 600,000 yards would have to be blasted. Between the time the contract was awarded and construction began, the cuts on this job were checked by seismic anaylsis—then in the early stages of development. The study showed the entire yardage could be ripped. Later the successful bidder handled all the ripping easily with two shanks. If only this contractor had known.

Cheap Process

Other more involved processes to determine subsurface conditions have been used up to this time, but the seismic study took only two men, 40 pounds of equipment and a few hours to complete. Other methods require highly trained personnel, many times more equipment and considerably more time. In some cases these other methods cost more than $500 for a single test.

Caterpillar Tractor Co. developed the seismic analysis process as a quick, easy and inexpensive method to determine if subsurface material is rippable without moving a tractor onto the cut. Tractor-ripper tryouts are time-consuming and expensive.

First, Caterpillar engineers looked at other methods to see if they could be adapted to this problem. The Los Angeles rattler test for hardness—conducted on a sample of rock—looked good at first. But hardness alone does not determine rippability. Even granite can be ripped economically if it is fractured or weathered. *Consolidation* is the key to rippability. Core drilling only tests spots, not overall conditions . . . and the rattler test checks only rock samples, not consolidation.

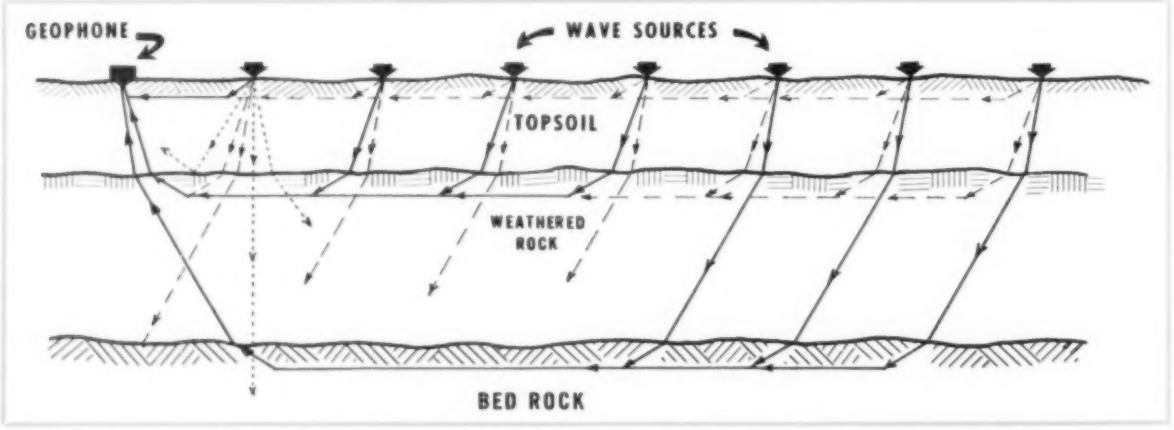


Figure 2. Operation of the seismic equipment can be seen in this diagram. Seismic waves are created at the arrows, starting at a point 10 feet from the geophone and moving out 10 feet at a time to 100 feet. At 10 feet, the wave near the surface is the first to reach the geophone. From 20 to 40 feet, the wave traveling through the denser weathered rock reaches the geophone before the waves traveling thorugh the less dense topsoil or the deeper bed rock. Beyond 40 feet, the waves traveling through the bed rock are the first to reach the geophone. Although these waves travel farther, they move faster.

How Seismic Analysis Works

Seismic analysis is based on the principle that sound or shock waves travel through different subsurface materials at varying speeds and along different paths. Speed of a seismic wave depends upon the type and density (or consolidation) of the material. Path of the wave varies with speed and the thickness of the layers of the material through which it passes.

A wave source will create numerous waves. At short distances the surface wave will be the first to reach the geophone receiving instrument. As the distance from the source to the geophone increases, waves refracted through denser subsurface materials will reach the geophone before the surface wave. Only the first wave received is recorded by the electronic time counter.

With this time and distance data, several applicable formulas and a graph will provide information on the depth of the layers of different density materials and the speed of the waves. Rippability then can be determined by identification of the materials and relating the speeds of the waves to the materials.

Next, the engineers tried the electrical resistivity method. This has been used successfully by Bureau of Public Roads and state highway engineers. In this method, an electrical voltage is applied across an area and the resistance of the earth is measured. This method gives good results in unconsolidated materials, but a typical state highway department believes it takes a trained geologist with a year's experience to accurately interpret the readings obtained.

Caterpillar wanted something simpler —something a user could handle with only a few days' training. The seismic analysis method offered these features. The refraction seismograph has been used extensively in mining and petroleum work. It is lightweight, sturdy and accurate. It can be operated with a minimum of training. The procedure was available—it was up to Caterpillar to interpret the results in terms of rippability.

Equipment needed for seismic analysis includes a source of a sound or shock wave, a receiver, an electric counter and a set of tables.

The sound or shock wave can be produced by several methods. In petroleum work, dynamite is usually used. This can give readings down to more than 25,000 feet. But, only shallow readings are needed to check a highway cut. Besides, even small shots should not be set off in many areas due to proximity of the contractor's men and machines, or because of the dangers of blasting in populated areas.

For the purpose of this type of seismic study, an 8-lb. sledge striking a 6-in. square and 1-in. thick steel plate produces an adequately sharp wave, strong enough to provide readings to depths of 50 feet.

The receiver is a standard geophone—a moving coil in a silicone fluid, resting on a base. A flat base geophone, which sets on top of the ground, is used if the surface is hard. A cone-shaped base can be pressed into the ground for better pickup in loose soils.

Measures Time

An electronic counter determines the time interval between the strike of the hammer and the arrival of the seismic wave at the geophone.

Knowing the time (in milliseconds) of the wave travel and the distance from the hammer to the geophone, the test crew can quickly compute the depth and wave velocity with two formulas. Caterpillar has conducted over 200 tests on construction jobs in 18 states to establish tables of rippability based on wave velocities for a dozen of the more common materials. Since wave velocities and rippability vary by consolidation, the table can be used to learn if a certain velocity through a certain material indicates it is rippable. Additional tests are being conducted to expand the list of materials covered as well as to narrow the uncertain zone between rippable and unrippable consolidations.

Contractor Jones asked his Cat dealer to check several cuts on his job to see if the material could be ripped. When the dealer's men arrived, he went along to see how the test was made.

The two men stopped their car on top of the cut and unloaded their equipment. First they opened a small metal case, about the size of an overnight case. Inside was the electronic counter, ready to operate on self-contained batteries. A geophone was set on the ground and its wire plugged into a receptacle in the face of the counter. One end of a 100-ft. wire was plugged into another receptacle, and the other end connected to a spring contact switch on an 8-lb. sledge. A small steel plate was set on the ground 10 feet from the geophone.

One man stationed himself at the counter to take readings while the second picked up the sledge. When the sledge struck the plate, the switch

Continued on page 30

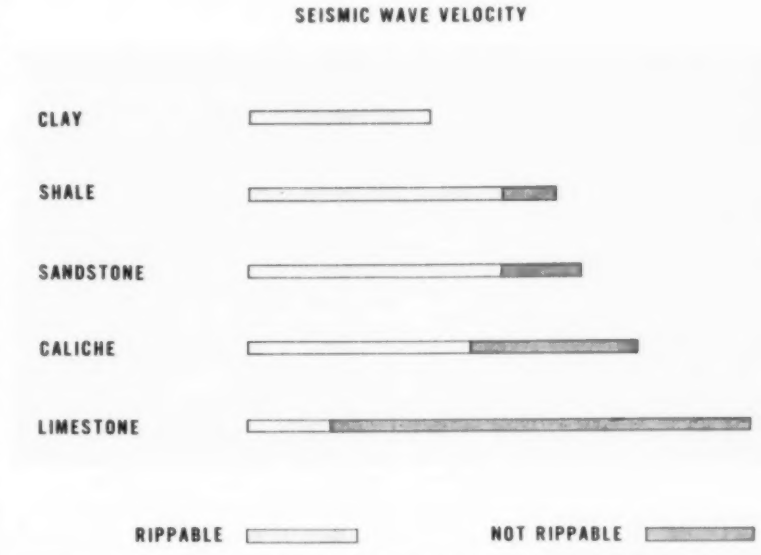


Figure 3. To determine if a subsurface material is rippable, Caterpillar engineers have compiled tables such as this on 12 common materials. The breakover point on wave velocity between rippable and non-rippable material varies for each type. Separate tables must be compiled for each size of ripper. This particular table was developed for the Caterpillar D9 tractor with mounted hydraulic No. 9 ripper.

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changes occurred was computed from another formula.

$$D = \frac{Xc}{2}\sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$

Here D is depth; Xc is the distance along the bottom of the graph from zero to the intersection point of the lines; V_1 is the velocity of the seismic wave in the upper layer; and V_2 is the velocity wave in the next lower layer. Depths of successive layers are determined in similar fashion. (See figure 1.)

Results indicated that topsoil extended 7 feet deep. Thirteen feet of weathered rock lay below this material, resting on bed rock 20 feet below the surface. Velocity of the seismic waves through the shale indicated it was rippable with a Caterpillar D9 tractor and No. 9 ripper (smaller rippers would not be able to handle such heavily consolidated material). The right angle test provided a check on the first test.

Accuracy of the method was proved on a highway job in New Jersey. The contractor already had checked the major cuts by core drilling. In addition, he had hired an engineering firm to test the cuts for location and consolidation of the sub-surface material. None of these results were made available to the Caterpillar engineers until after their test was completed. The two sets of test data could then be compared.

Excellent Results

In 1½ hours the Caterpillar engineers had completed their test and computations. Where access roads had been required for the heavier seismic and boring equipment of the previous test, for this analysis the two men carried in everything in one trip. The seismic analysis classified the materials to 40 feet deep (5 feet below the deepest cut). In each, the top layer was topsoil above heavily fractured gneiss, underlain by solid gneiss bedrock. The breakover point from rippable to non-rippable consolidations varied from 12 to 20 feet deep. Results of this test established these points within 6 inches of those by the previous, more expensive tests.

Contractor Ed Jones is well satisfied with the results provided by the test on his job. He knows the seismic analysis will determine when he can rip and when he must resort to blasting. It will enable him to use his equipment more efficiently. He can expect greater profits through fast, inexpensive subsurface analysis, more productive equipment and job organization, and lower costs.

Seismic . . .

Continued from page 29

snapped closed, starting the counter. Lights flashed across the counter, marking the milliseconds fleeting by until the seismic wave reached the geophone. This wave stopped the counter, and the steady shining lights indicated the time lapse. This time was noted on the data sheet opposite the distance from plate to geophone while the hammer man moved the plate to a new location, in line with the first, but 20 feet from the geophone.

Process Repeated

This process was repeated every 10 feet until the plate was 100 feet from the geophone. Then a second set of readings was run at a right angle to the first.

In 30 minutes, the test was completed and computations were made. Velocity (V) of the seismic wave was found by this formula:

$$V = \frac{D}{T}$$

The letter D is distance from the plate to the geophone and T is the time lapse. This data was plotted on a graph, with distance in feet plotted along the bottom and time in milliseconds plotted up the side. Points fall in line for each type of material since velocities are the same for a similar consolidation. Straight lines drawn through adjacent points showed three types of materials. Intersection of the lines indicated the changes in consolidation.

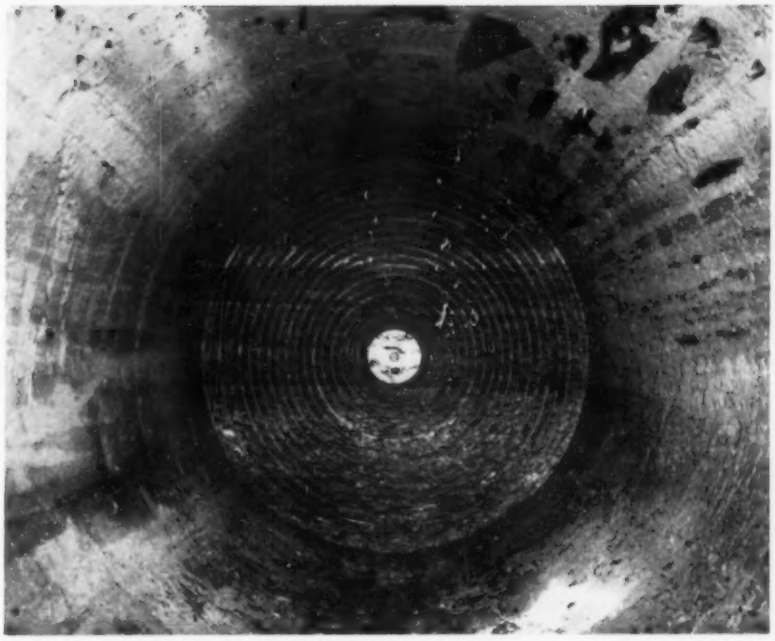
Next, the depth at which these

"Adjustable operator's seat on this crane—see?"

World's Largest Mole Tunnels at Oahe Dam

Tunnel boring machine is designed to cut 29½-ft. diameter tunnel through shale.

by Bob Karolevitz



Walls of a large-diameter tunnel bored in hard limestone and shale by a Robbins mole are so smooth they give the impression of looking down a shotgun barrel. Concentric circles on the face of the tunnel are made by disc cutters. Cutting to exact size with no waste tunneling or rough breakage is a major advantage of the mole.

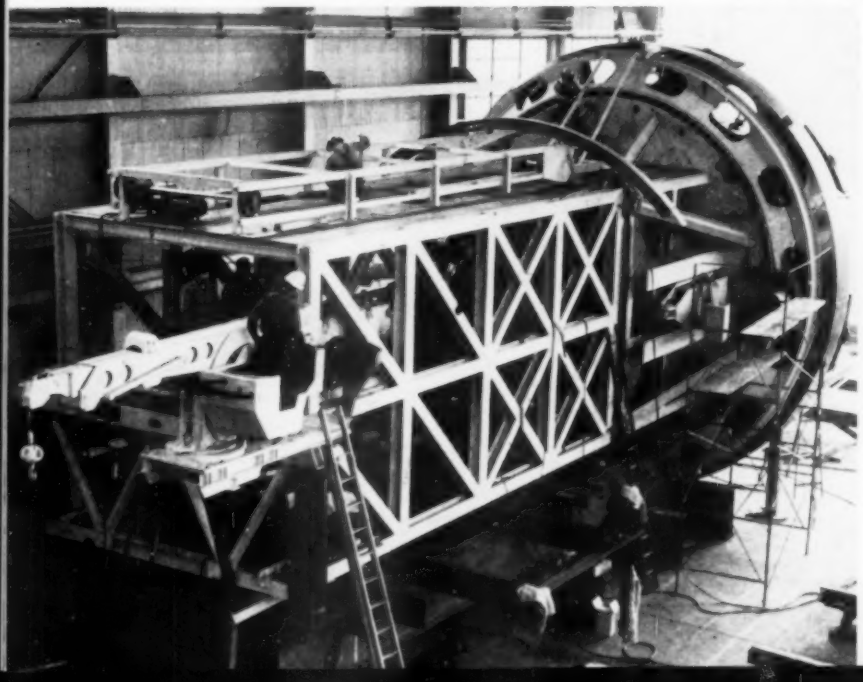
OAHE Dam on the Missouri River near Pierre, S. D., is the site of an extensive tunneling job where the world's largest continuous tunnel-boring machine—the Robbins mechanical mole model 351—has gone into operation. The big 29½-ft. diameter mole follows two smaller models which have performed successfully on previous tunnel work at the project.

When contracts were prepared for the diversion and power tunnels at Oahe Dam, the U. S. Army Corps of Engineers specified that no blasting would be permitted because of the unpredictable nature of the treacherous Pierre shale strata underlying the dam site.

Contractors for the initial diversion phase of the project—F. K. Mittry Constructors, Los Angeles, Calif.—solved their problems by discarding the conventional drill, blast and muck method and replacing it with a new principle. The answer was found in the Robbins machines. The moles are named after their designer, James S. Robbins of James S. Robbins & Associates, Seattle, Wash.

The first machines had the task of boring six 1,800-ft. diversion tunnels, each 25 feet 9 inches in diameter. So successful were the results that Morrison-Knudsen-Kiewit-Johnson, contractors on the Oahe power tunnel phase, ordered the unprecedented 29½-footer to bore seven larger diameter tunnels.

Photo of big mole shows its main body to rear of the cutting head. The fuselage houses a conveyor for carrying away shattered rock. It also has a delivery and jig system for handling tunnel ribs which are put into place as the machine progresses.

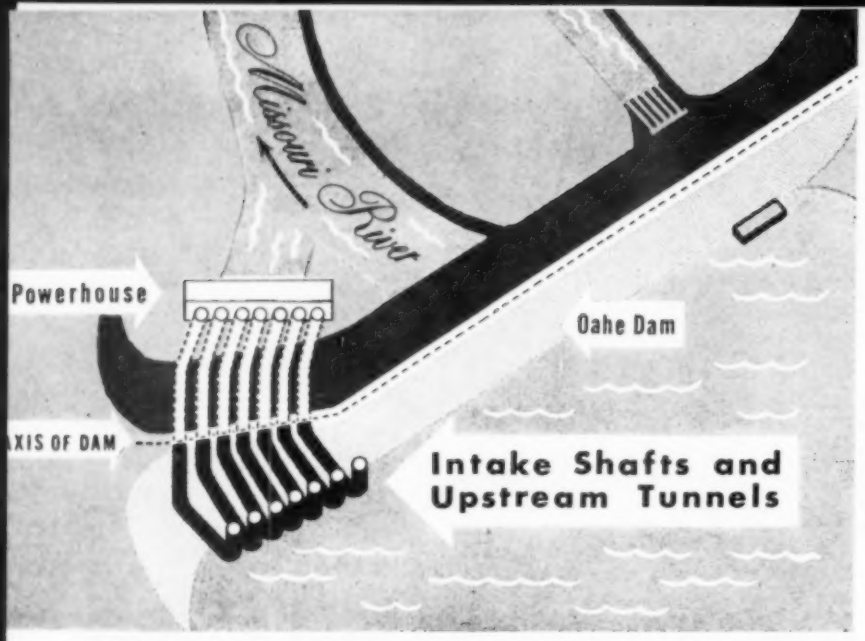


Weighs 200 Tons

The newly built model 351 weighs almost 200 tons and is 55 feet long. Its huge cutter head was built by Todd Shipyards, and the machine was fabricated and assembled by Pacific Car & Foundry Co., Seattle, before being shipped by rail to the dam site.

Robbins moles consist of two principal parts—a cutter head and a jumbo structure fuselage or main body.

The cutter head on the 29½-ft. diameter model 351 houses eight cutting arms on its clocklike face. Eight additional cutting devices operate on an outer rim which also carries the buckets to remove the cuttings. A shield behind the revolving cutter head confines the rock close to the face of the tunnel where it can be picked up by the buckets, carried to the top of the head and



Sketch shows location of the seven intake shafts (black areas) and seven upstream power tunnels being excavated by Morrison-Knudsen-Kiewit-Johnson with big mechanical moles.

dumped onto a conveyor which, in turn, transports the material back through the fuselage and out of the tunnel.

Cutting of the soft Pierre shale is done with a two-way procedure. Drag-type tungsten-carbide bits are attached to the cutting arms in tapered sockets (for easy replacement). As they travel in circular paths, they cut grooves or kerfs into the tunnel facing. Disc-shaped cutters of hard-faced steel alloy are mounted behind the fixed tools. These rotary cutters also cut concentric circles on the tunnel face, but between the kerfs made by the stationary bits. The resulting pressure shatters the core between the kerfs well below the point of contact of the discs.

At Oahe the smaller size moles advanced a 25-ft. 9-in. hole at a maximum rate of 12 feet per hour, producing 480 tons of broken rock. A similar speed is expected for the larger model, with considerably more tonnage involved because of the much greater cutting face. In achieving their efficient boring pace, the smaller moles seldom required replacement of rotary cutters throughout the entire tunneling job. The fixed tools, however, needed regular replacement, though this amounted to less than $5 per foot of tunnel.

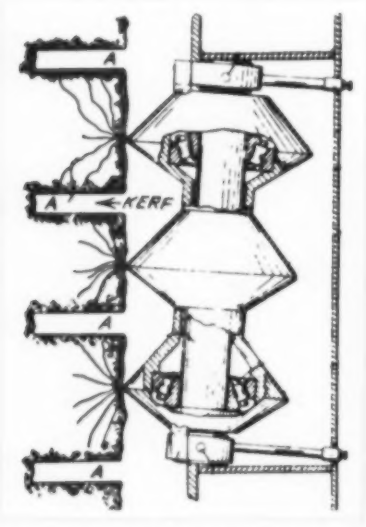
The fuselage of the mole serves several functions. First, it houses the conveyor system which removes the cuttings. Second, it carries a special jig and mechanical delivery system for the steel tunnel ribs which are installed concurrently with the advance of the machine. Four segments of rolled structural steel I-beams form the circular ribs which are fastened to the walls with tapered wedges and connected to the completed ribs behind by means of tie-rods.

On the Oahe project, specifications call for a 4-ft. interval between ribs to provide good support against the unstable shale. These ribs, incidentally, serve not only as tunnel supports during boring operations but become part of the steel reinforcing for the concrete tunnel lining.

Third, the fuselage houses the propelling force for the boring head. Two 400-hp motors provide the power to operate the elephantine device. Hydraulically-operated side jacks on hinged arms push the machine forward against the tunnel ribbing and the wall. Meanwhile, expanding shoes in the shield of the cutter head grip against the walls for stability.

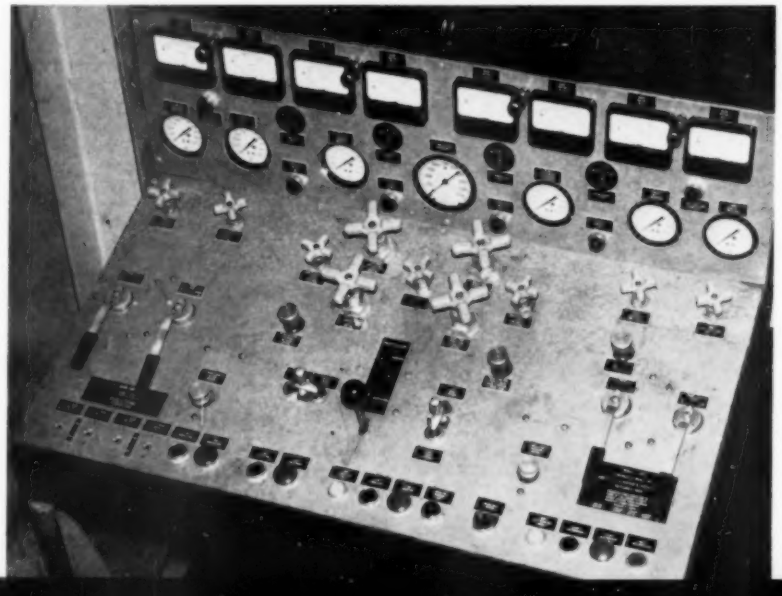
A special ground-leak detection system has been used on the moles at the Oahe project. Any electrical leakage or grounding is picked up by the device which automatically shuts off all power when a certain danger level is reached, thus protecting the operator and crew from a "hot machine" condition.

At present James S. Robbins & Associates—now headed by Richard J. Robbins since his father was lost on an air trip between Denver, Colo., and Seattle last December—is adapting the boring machine to production mining. Also being developed for the mining industry is a continuous shaft-sinking mechanism.



Drawing shows how the alloy steel rotary cutting discs break down the cores between the kerfs cut by fixed tools.

Robbins model 351 mole is electrically operated by one man using this console. The operator is located in a protected compartment directly behind the cutter head.



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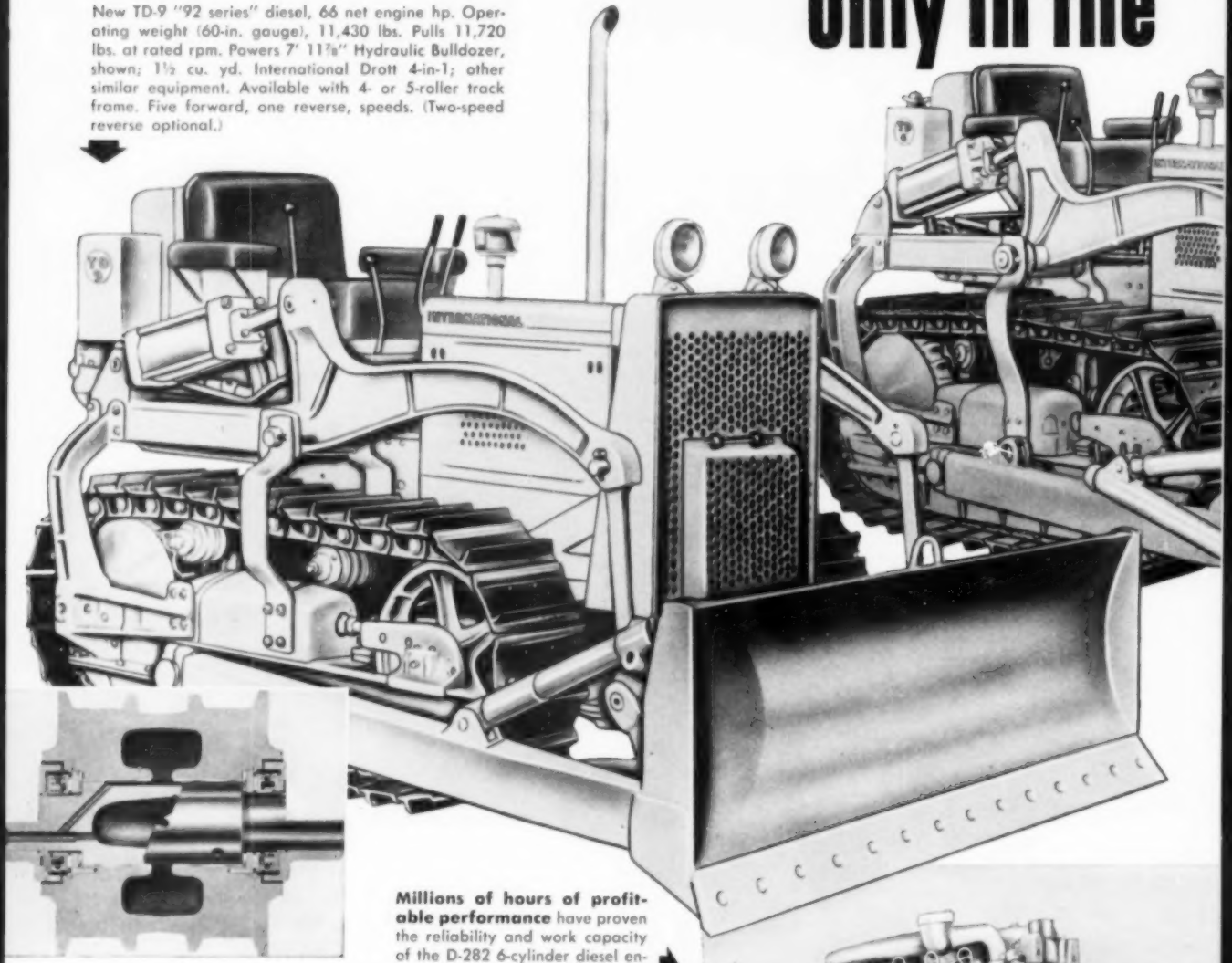

New 500-hr. lube interval TD-6 and TD-9 track rollers are of heavy-duty International design. Heavy-duty roller bushings are supplied from big 300% increased lube reservoirs. Exclusive vented shafts in top and front idlers, and in track rollers protect the seals from over-lubrication.

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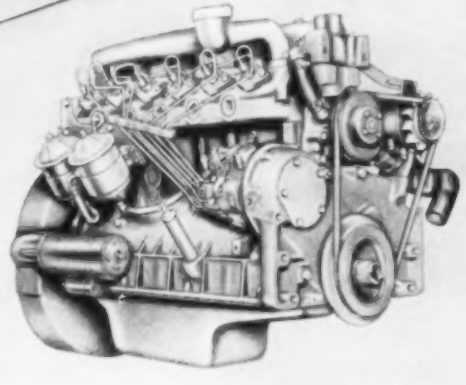

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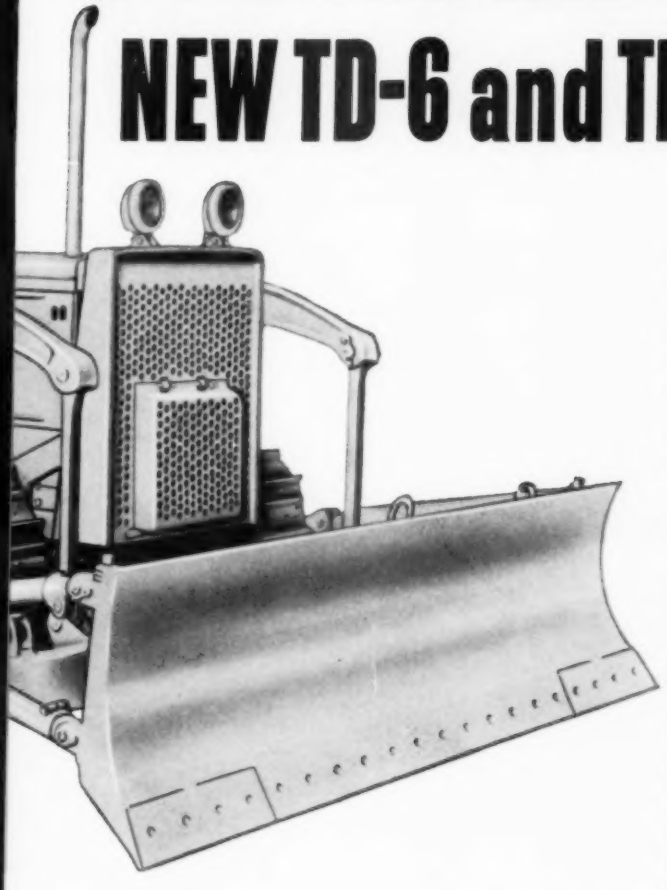


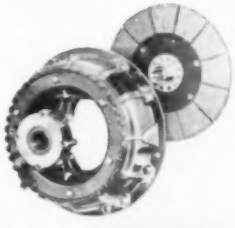
Now you get the smoothness, the high-production power wallop, the dependability of a fully-proven, fuel-thrifty 6-cylinder International diesel engine—only in the new TD-6 and TD-9 crawlers. This high-torque diesel has direct-electric starting; simple, compact, rotary-type precision fuel injection!

New TD-6 and TD-9 crawlers have exclusive vented shafts in track rollers, and top and front idlers, to assure positive seal protection from over-lubrication. And newly-designed track roller shells have a big, 300% increased lube capacity, to make 500-hour lube intervals a practical reality!

Both of these versatile new models have the power-transfer efficiency, and all-temperature workability of new dry-type, full-face sintered metal engine clutches. Choose from a proven line of dozers, loaders, and other equipment to take full advantage of TD-6 or TD-9 six-cylinder power!

From direct-start button to heavy-duty radiator guard, new TD-6 and TD-9 crawlers practically put their new production boosting advantages under "touch control." Let a "no-holds barred" competitive demonstration prove how easily you get their big bonus margin of earning capacity. See your International Construction Equipment Distributor!

Smooth, high-torque 6-cylinder diesel power make the new TD-6 or TD-9 ideal clean-up dozer units on any sized contract; or main-producing units with dozer or excavator-loader on many sizes of jobs!



Here's the sintered metal engine clutch driven member—for TD-6 and TD-9 crawlers. New full-face design provides smooth mating of surfaces, gives the holding power and heat defiance for full-torque performance. And you get all the other advantages of dry-type clutch simplicity and low upkeep!

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Trucks place fill in embankment while dozers spread material into 9-in. thick layers, which are compacted by sheepsfoot rollers.

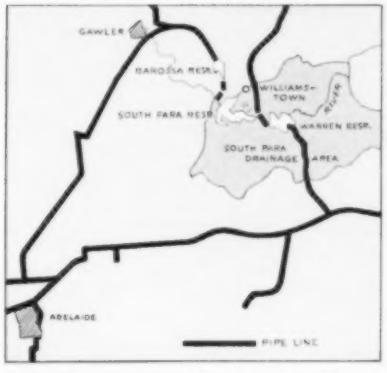
Dam Boosts Water Supply of South Australia City

A ROLLED fill dam has been constructed across the South Para River near the township of Williamstown, South Australia. Its purpose is to augment the water supply of Adelaide and farm country served by existing Barossa Reservoir. Adelaide is the capital city of South Australia, and is situated in the southern portion of the province about six miles inland from the Gulf of St. Vincent. The population of metropolitan Adelaide is about 500,000.

Recently completed South Para dam is 150 feet high, 950 feet thick at its base and 30 feet thick at its crest. There are rock drainage toes on the embankment's upstream and downstream slopes. The remainder of the structure consists of crushed phyllite, a comparatively soft rock which was specially treated prior to being placed so it could be compacted without difficulty by sheepsfoot rollers.

Job Quantities

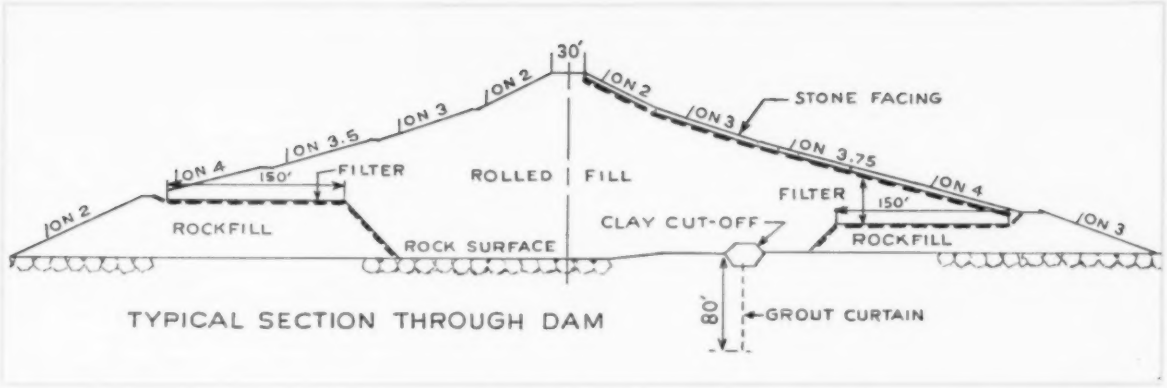
Total amount of material in the South Para embankment is 750,000 yards. Of this, 112,000 yards is rock fill in the drainage toes and dumped riprap on the dam's upstream slope. There is no central core. A clay core was originally intended, but permeability tests on the phyllite indicated little advantage could be obtained by including one. The riprap was placed by end-dump trucks which were lowered down the embankment slope after being anchored to a dozer on top.



Here's the geographical relationship of South Para to Warren and Barossa reservoirs. Mains feed the water to cities.

The South Para River runs through an area of relatively high rainfall by South Australian standards, where the average annual fall on the drainage area is 27½ inches. The river already supplies two large reservoirs. Warren Reservoir is built in high country and receives the run-off from the upper 40 square miles of the South Para drainage area. Barossa Reservoir is located on a lower level and receives the run-off from the lower 48 square miles of the drainage

South Australia Engineering and Water Supply Dept. builds rolled fill dam on river already serving two reservoirs. Structure contains 600,000 yards of specially treated fill.



Cross-section reveals composition of embankment. Dam is 150 feet high, 950-ft. thick at its base and 30-ft. thick at its crest.

(Above) Ruston-Bucyrus 10-RB loads Euclid truck inside tunnel. (Below) Riprap is placed on upstream slope of dam by 10-ton Euc anchored to Cat D8 tractor.

area. When Warren is full, Barossa receives the run-off from the entire 88 square miles. The capacities of these two reservoirs is only 1.4 billion and 993 million gallons respectively.

Because of its location between these two reservoirs, South Para stores the run-off from both upper and lower levels of the 88-square mile drainage area. Surplus or overflow water from Warren Reservoir is allowed to gravitate into South Para. South Para's entire supply is in turn discharged into Warren Reservoir, from which it is drawn for public use.

Variable Rainfall

South Para Reservoir has a storage capacity of 10 billion gallons, but an estimated safe annual draw-off of only 2.2 billion gallons. This comparatively small annual draw-off illustrates the extremely variable nature of the annual rainfall over the drainage area, which has ranged from 12.2 to 44.3 inches per year. The average annual run-off is about 4.8 billion gallons, but the South Para River and its tributaries show considerable seasonable fluctuation in flow. They usually cease to run during the summer months.

Because of the variation in rainfall, there is also a corresponding variation in annual run-off, which has varied between 20.9 billion and 100 million gallons. These figures point to the difficulty in estimating the effective capacity of a dam for a drainage area of this type. There is also an average annual evaporation loss of a little more than five feet, which accounts for a considerable amount of water lost.

As a preliminary to earthfilling operations, South Para River was routed around the dam site through an 800-ft. long, 22-ft. diameter diversion tunnel. A French construction firm exca-

A 2½-yd. Ransomes and Rapier model 490 electric shovel and a Ruston-Bucyrus 33-RB load broken rock into 10-ton Euclid rear-dumps at site of spillway excavation. At upper left, a Ruston-Bucyrus 22-RW drill puts down 5½-in. diameter holes.

vated and installed steel supports in the driven portion of the tunnel, which was a 426-ft. long section bored through solid rock. The remainder of the diversion tunnel was a conduit built by the cut-and-cover method.

Working from both portals on the driven portion, the French firm first punched an 8 x 8-ft. pilot tunnel the entire length of 426 feet. The pilot tunnel was later enlarged to form the arch section of the main tunnel, whose full diameter was carved out by mucking crews who benched down the invert in a series of lifts.

Rock Hauling

Blasted rock was hauled out of the pilot tunnel with scrapers operated by truck-mounted air winches positioned at the portals. The material was brought to the portal opening where it was loaded by a Ruston-Bucyrus 10-RB shovel into Euclid 5FD dump trucks and hauled to spoil. When work had reached a point where the tunnel opening was large enough, the 10-RB moved right inside, loading muck from the floor at the bench face directly into the Euclids. The material was pulled from the face to the excavator by an International TD-24 tractor fitted with a specially shaped blade.

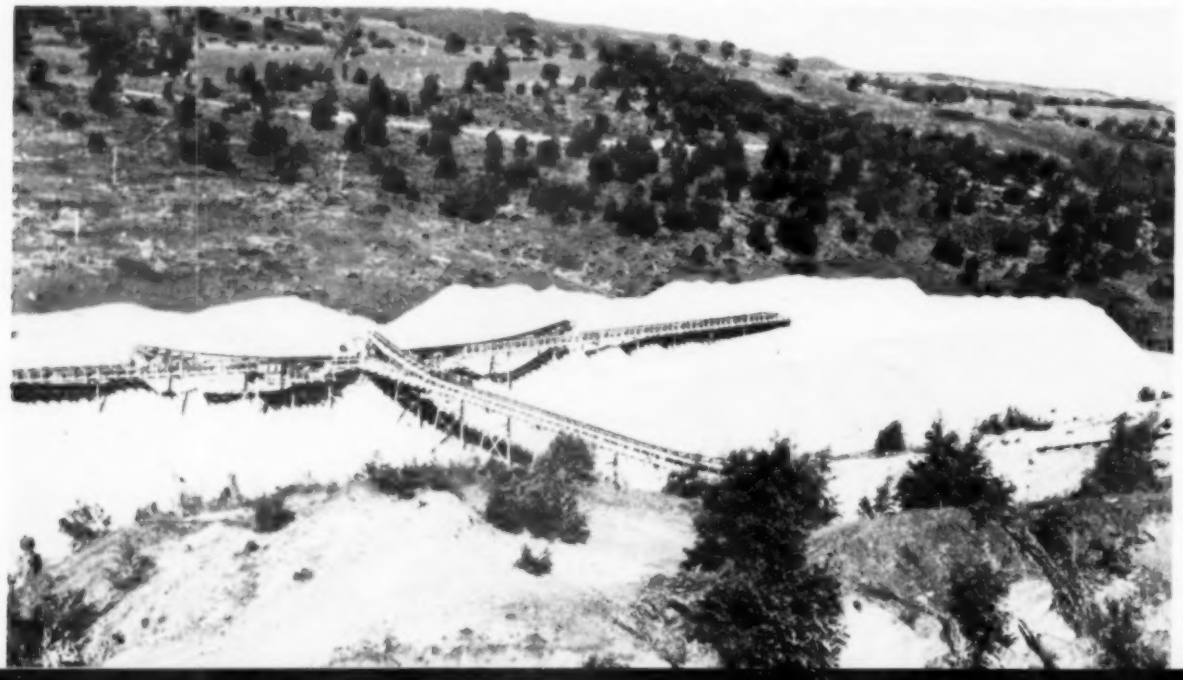
When completed, the tunnel was given a concrete lining, which was placed by a 6-in. pipe strung from a delivery pump erected 200 feet from the upstream portal. Concrete was placed on the cut-and-cover conduit section by 1-yd. hopper buckets filled at the batch plant, hauled to the pour site in trucks and swung into position by a Ruston-Bucyrus 33-RB crane.

While the diversion tunnel was being constructed, stripping of the embankment site also took place. The abutments were cleaned down to solid rock by bulldozers, which pushed the top soil down into a valley. There Ruston-Bucyrus 33-RB and 43-RB draglines loaded the material into trucks for disposal. Over 100,000 yards of dirt were removed from the dam site prior to the start of the earthfilling operations.

Rock for the new rolled fill structure came from the excavation for its spillway, a sloping channel 450 feet wide at the top, 350 feet wide at the bottom and 650 feet long. Construction procedure here consisted of drilling, blasting, loading and hauling with end-dump trucks to a crushing plant where the rock was reduced to minus 4-in. size.

Drilling at the spillway site was han-

View shows conditioning area where fill is dozed into layers, saturated with water and allowed to stand until suitable for placing in embankment. Main conveyor comes from crushing plant off right side of picture; transverse conveyors are at left.



dled by three Ruston-Bucyrus 22-RW percussion rigs. These units put down 5½-in. diameter holes on 17-ft. centers to an average depth of 45 feet.

Size of shots was limited somewhat by a specification that required the spillway be lined with concrete. This meant the spillway had to be developed with a defined area, demanding fairly good control, which could only be assured by smaller shots. Maximum yield from any one blast was 33,000 yards.

Loading was done with a 2½-yd. Ransomes and Rapier model 490 electric shovel. A Ruston-Bucyrus 33-RB was also brought in occasionally to speed up the loading job. These machines swung over 10-ton Euclid end-dump trucks, which hauled to a crushing plant at the upper end of the spillway excavation.

Two 30 x 18-in. roll jaw crushers, set side by side, reduced the blasted rock to the required minus 4-in. size. The crushed rock was then discharged onto a 30-in. wide, 840-ft. long conveyor belt that terminated over two transverse conveyors which formed a T shape with the first belt. These transverse conveyors were supported on timber gantries and had traveling trip heads at selected points to unload the belts.

Saturation Process

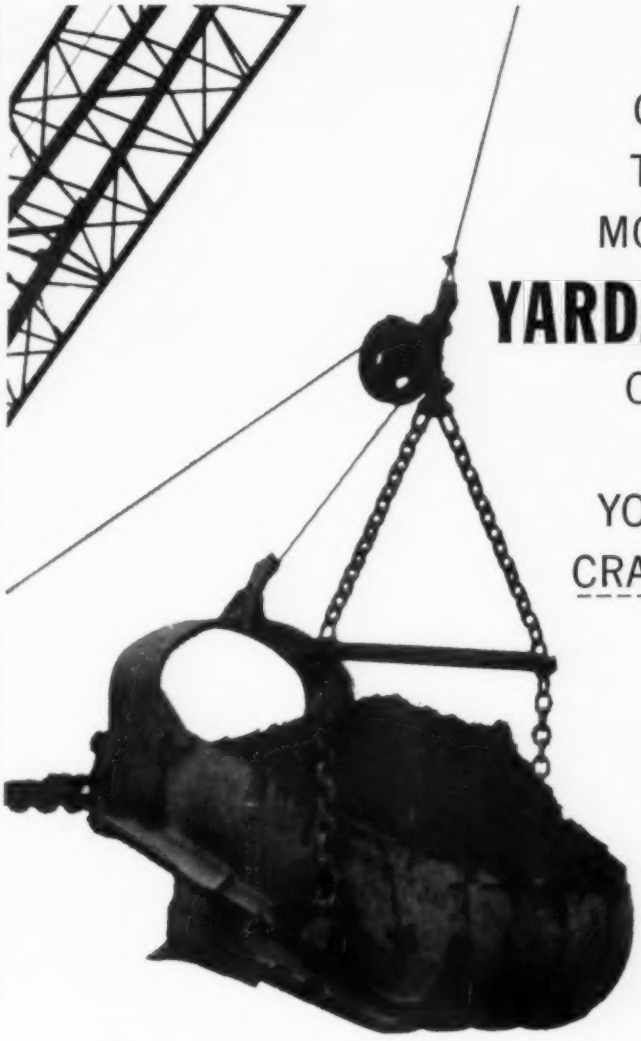
The material was dozed from beneath the conveyors and spread into loose layers nearby. Each successive layer was saturated with water by means of spray, irrigation-type sprinklers. It was then allowed to stand for at least six weeks or until a material of uniform moisture content was obtained.

When the rock was "conditioned"—had reached a moisture content of 9% throughout—it was loaded into Mack highway-type 10-ton end-dumps by Ruston-Bucyrus 22-RB and 33-RB shovels, then hauled to the embankment.

Dozers spread the conditioned fill into 9-in. thick layers on the embankment. Tournapacker rollers, with a toe pressure of 800 pounds per square inch, compacted the material to its required Proctor density. Compactive effort varied with the grading of the material.

The South Para project was under direction of the South Australian Engineering and Water Supply Department, with R. J. Shannon heading operations as resident engineer.

Article based on information supplied by the Engineering and Water Supply, South Australia, to Ruston & Hornsby (Australia) Pty. Ltd.



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Williams Bucket Div., The Wellman Engineering Co., 7000 Central Ave., Cleveland 4, Ohio, U. S. A. Branches, New York, 420 Lexington Ave., Chicago, 520 North Michigan Ave., Birmingham, Alabama, 2805½ Cahaba Rd.

Although space is confined during early stages of construction of the dam's core trench, Supt. Buster Davis keeps work flowing steadily. A turbo-charged Cat D7 tractor (center) heads up out of the core trench, following the DW15-No. 428 tractor-scraper which it just pushloaded. Fill is compacted by a 6 x 6 Ferguson sheepsfoot, pulled by another D7. The D6 (back left rear), spreads the fill while a Bucyrus-Erie 15-B dragline handles material too wet for the scraper.

Small Dam Has Unusual Water Problem

Heavy overflow from municipal water supply system is routed around new dam site.

FARM ponds and watershed structures are usually small in earth-moving yardage, but they frequently present problems as difficult to contractors as larger projects. Contractor W. J. Garvin recently used an earth-moving fleet including a dragline, a rubber-tired scraper and bulldozers to build a small dam on a farm creek northwest of Oklahoma City, Okla.

For a job of its size, Garvin had a downright annoying and rather hazardous water problem.

Every 30 hours, one million gallons of water gushed down Bluff Creek on the E. K. Gaylord dairy farm. And every 30 hours that flood posed a threat to Garvin's crew, attempting to dam the creek to store irrigation water for Gaylord's farm.

Bluff Creek is normally a small, quiet stream, carrying overflow from Lake Hefner, Oklahoma City's municipal water reservoir. At 30-hour intervals, the filters for the water supply are flushed, and the million gallons of flushing water are turned into Bluff Creek.

Builds Cofferdam

Buster Davis, superintendent for the Purcell, (Okla.) firm, moved onto the job February 26, and finished the job by the middle of spring. First his crew had to build a cofferdam across the creek large enough to contain the periodic flood. Then two pumps—a 4-in. and a 6-in.—were installed to pump the water around the construction site through two 1,200-ft. aluminum irrigation pipes.

Next Supt. Davis moved in his earth-moving equipment to remove unsuitable material and build the dam and dikes. An excavation for the core of the dam was cut 10 feet below the old stream bed by a ½-yd. Bucyrus-Erie 15-B dragline and a Cat DW15-No.

A constant threat to work on the dam is posed by a million gallons of water flooding down Bluff Creek when the filters for Oklahoma City's water utility are flushed every 30 hours. Garvins used a 4 and a 6-in. pump to move water around the site.

428 tractor-scraper. Suitable fill material was excavated from the emergency spillway section in the left bank for use in the dam and dikes. A turbocharged Cat D7 tractor worked with the DW15, pushloading heaping loads of dry red clay and sandstone into the scraper, cutting slopes and handling various production and utility dozing assignments.

Fill was spread by a D6 for compaction to 95% under a 6X6 Ferguson 120 sheepsfoot roller, pulled by another D7. A water truck and a Ferguson tractor with a disk were kept busy on the fill to bring the extra dry clay up to necessary moisture content.

About 13,000 yards were excavated from the emergency spillway. Half of this, about 6,000 yards, were packed into the 400-ft. long, 25-ft. high dam. It has a 16-ft. crest, with 3 on 1 face and 2 on 1 back slopes. Another 3,000 yards were used to build a 500-ft. long dike, with the same profile as the dam, forming a 10-ft. deep, 60-ft. wide channel from the spillway to the creekbed. The remaining 4,000 yards were used to fill gullies in the area.

10-Ft. Reservoir

Bluff Creek Dam will normally store 10 feet of water, controlled by an 18-in. reinforced concrete drawdown tube under the structure. It will hold another five feet of flood water to the spillway. Eight inches of reinforced concrete protect the 2 on 1 side slopes of the spillway through the dam, and a reinforced concrete drop structure protects the end of the channel. The rest of the dam and spillway will be sown with Bermuda grass.

Jim Carver was project engineer for the George G. Toler Engineering Co., designers of the structure.

Working on the left bank, W. J. Garvin's Cat DW15-No. 428 tractor-scraper and D7 excavate for the spillway through Bluff Creek Dam. Overflow will be carried through a 500-ft. channel leading from the area of the D7 through the lower left corner.

Rugged hill country is the scene of Morrissey's work. This 4-yd. 88-B loads dolomite from cut No. 1, one of three on the job.

Rock Job in Pennsylvania Hills

NEARLY 750,000 cubic yards of rock and an equal amount of material ranging from gravel to shale are being excavated for a 5½-mile highway in eastern Pennsylvania's scenic Monroe County.

Known as the Stroudsburg bypass, the four-lane divided, limited-access highway starts at the famous Delaware Water Gap on the Delaware River and terminates in Stroudsburg east of Broad Street. The highway, in the rugged gateway country leading to the Pocono Mountain resort area, eventually is expected to tie into the proposed Sharon Thruway. Interchanges are being built at Delaware Water Gap, Minisink and Prospect Street in East Stroudsburg.

The Delaware Water Gap is formed by a break in the Kittatinny Range of the Blue Mountains. The Delaware River winds through a picturesque gorge between wooded hills which rise steeply to a height of about 1,200 feet above the river.

James D. Morrissey, Inc., moves 750,000 yards of dolomite to construct a 5½-mile bypass in rugged country near Stroudsburg. Spread includes shovels ranging from 2 to 4½-yd. sizes.

Two Ingersoll-Rand Tractairs drill 3½-in. holes through solid ledge of hard dolomite. Rock is used as roadway fill material.

A well-known Philadelphia company, James D. Morrissey, Inc., is constructing the highway under a $5¼ million contract awarded in June 1958. Morrissey started to work immediately and had 235 working days to complete the job. Morrissey has an impressive spread of equipment that includes, among other items, seven shovels with dippers ranging in size from 2 to 4½ yards; more than 20 end and bottom-dump haulers; scraper-tractor units; drills; and an assortment of bulldozers.

Major Cuts

When *Excavating Engineer* visited the job, Morrissey's job superintendent, Walter Rinehart, had most of his equipment deployed in three major cuts.

Cut No. 1, largest and most rugged of the three, is located a mile from the eastern end of the job, above the Delaware Water Gap interchange area. Approximately 300,000 yards of rock were to be taken from this cut.

Cut No. 2, in the Minisink interchange area, was figured at approximately 300,000 yards. Cut No. 3 is at the East Stroudsburg interchange. Excavated material from this cut is being placed in an 80-ft., 540,000-yd. fill where the project crosses Brodhead's Creek at the western end of the job.

A 500-ft. long plate girder span will carry the highway across twisting Brodhead's Creek and the Lackawanna Railroad right-of-way in the area between cuts 1 and 2. The project includes 11 bridges of varying types, ranging in length from 100 to 500 feet. Bridges are being built by a sub-contractor, Kingston Contracting Co., West Point, Pa.

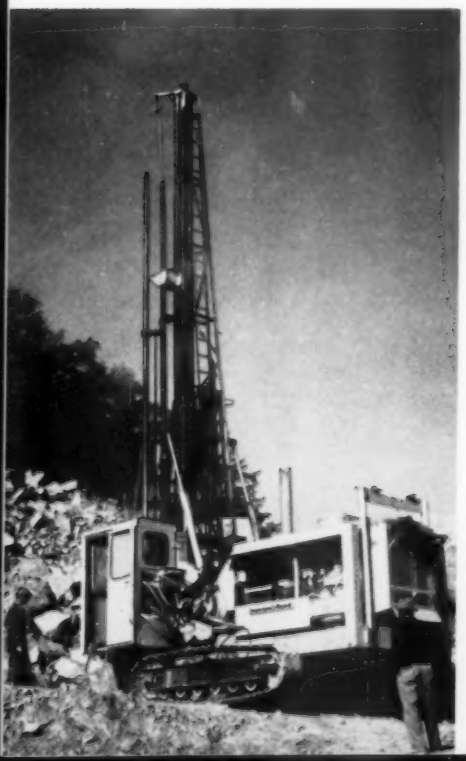
This 3½-yd. 1055 is working in 300,000-yd. cut No. 2. Five Euclid dumps haul the boulder-strewn material to dump sites. In all, there are 20 Euc trucks on the job.

Some delay was encountered in clearing the right-of-way. The last house was not moved until September. Three Lorain 85 cranes and a 1½-yd. Link-Belt 165, three Caterpillar D8, two Allis-Chalmers HD-20 bulldozers and an International TD-24 handled the clearing.

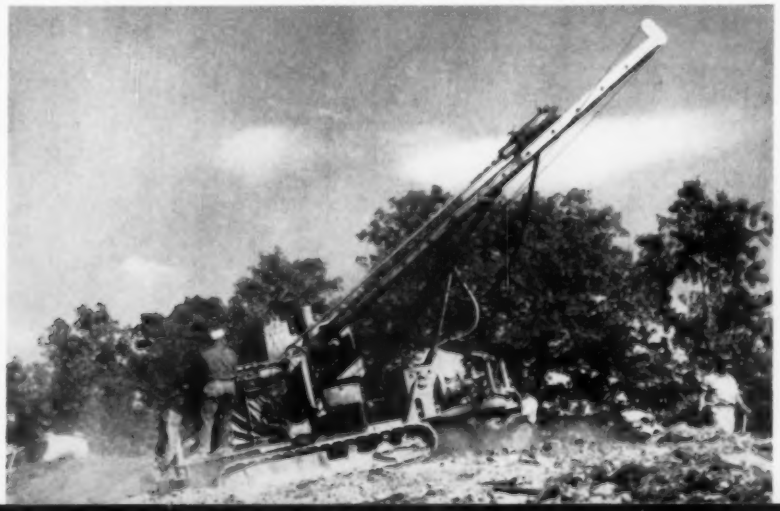
Morrissey purchased a new shovel, a 4-yd. Bucyrus-Erie 88-B, to work in Cut No. 1. The shovel went into action without the usual formalities of swabbing it with Morrissey's characteristic green paint.

Three 35-ft. benches with 16-ft. shelves are being carved out of the tough dolomite in Cut No. 1 by the

Continued on page 61



(Left) Drillmaster provides large-diameter blast holes for heavy charges of powder. (Below) Another type drill in use is this crawler-mounted 4½-in. Joy shown moving uphill toward a new location. (Above) Bits for the drills are ground sharp on the job.



News from the Field

Moles Elect President

Mansell L. MacLean, president of MacLean-Grove & Co., Inc., was elected president of the Moles at the group's annual meeting May 6 at the Biltmore Hotel in New York City. He succeeds Howard A. Collins, president of the Howard Collins Construction Co., Inc. The Moles are an association of heavy-construction engineers and executives.

Other officers elected were: Chester W. Cambell, of the Foundation Co., first vice president; Harry T. Immerman of Spencer, White & Prentis, second vice president; Eugene G. Rau of J. Rich Steers, Inc., treasurer; Eugene F. Moran, Jr., of Moran Towing Corp., secretary; and Robert S. Mayo of Mayo Tunnel & Mine Equipment Co., sergeant-at-arms.

Four men were elected to three-year trusteeships: George F. Ferris of Raymond International, Inc.; M. C. McGough of Merritt-Chapman & Scott Corp., Charles B. Molineaux of the Arthur A. Johnson Corp., and John J. Walsh of the Walsh Construction Co.

The new Moles president, like his predecessor, is a resident of Larchmont, N. Y. Canadian-born, he came to the United States in 1924 and has been engaged in the heavy-construction industry ever since. Prior to 1951, he was associated with Samuel R. ("Subway Sam") Rosoff in the construction of subways in New York and of tunnels in New York and Mexico. In 1951, he joined with Philip Grove, also a Mole, to form the company he heads.

The MacLean-Grove organization has constructed deep underground liquid petroleum storage facilities in Illinois. In cooperation with two other companies it served as the managing contractor on the recently completed third tube of the Lincoln Tunnel. One of its current projects is a tunnel under the Rhine river at Dusseldorf, Germany—to be the first tunnel crossing of that stream.

Special Tongs Speed Removal of Steel Piles

Use of semi-automatic tongs saved approximately 150 hours time when sheet steel piling was pulled after construction of the foundation for the Crown-Zellerbach building, a new skyscraper going up in San Francisco, Calif.

Orin A. Tess, construction superintendent for Ben C. Gerwick, Inc., the foundation subcontractor, said the tongs saved about 15 minutes time on each of 600 piles, compared with traditional methods. A direct comparison was possible, because the tongs were not employed until after about one-fourth of the piles used on the job had been removed.

Formerly the contractor burned four 3-in. holes in the top of each pile and inserted pins attached to a wire sling. In addition to taking time, this made it necessary to scrap one lineal foot of each pile.

The new tongs, designed by Heppenstall Co., Pittsburgh, Pa., grip a pile firmly and pull it safely, with no need for boring holes or inserting hooks. "Sidewalk superintendents" were amazed at the speed with which the tongs worked and at their tremendous pulling power. Lowered over a pile with their jaws locked open, the tongs are ready to pull as soon as the operator allows a bit of slack in the line, causing the jaws to close. After the load is safely delivered, a workman positions a link that holds the jaws open. The tongs are then ready for lifting another load.

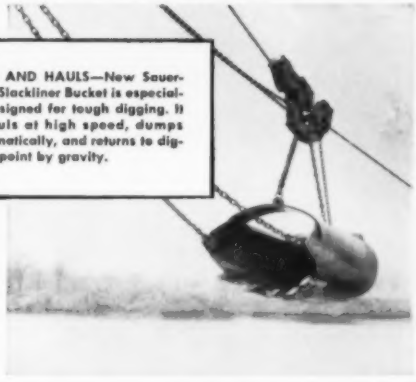
The tongs were designed for a pulling

Continued on page 46

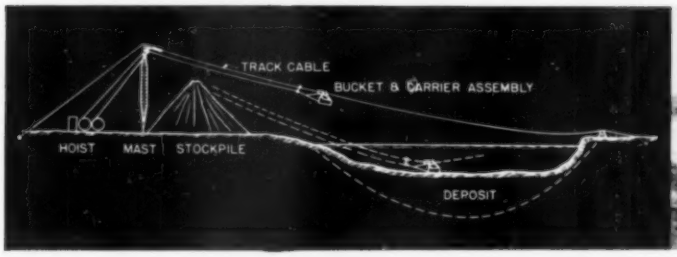
Steel piling is pulled at the site of a San Francisco skyscraper by semi-pneumatic tongs. Jaws of the tongs have a 6-in. opening and can pull up to 100,000 pounds.

FROM PIT TO STOCKPILE...

Dig and Haul at Lowest Cost with a Sauerman Slackline



DIGS AND HAULS—New Sauerman Slackliner Bucket is especially designed for tough digging. It inhauls at high speed, dumps automatically, and returns to digging point by gravity.



STOCKPILES MATERIAL—Regardless of long hauls, the Slackline builds a large surge pile to allow charging the plant at any desired rate. Plenty of material is in ready reserve for seasonal or unexpected increases in schedule.

Operating costs as low as 8¢ per yd. for labor, power and maintenance are reported by Slackline Cableway owners when digging free-caving material at average depth and haul distances.

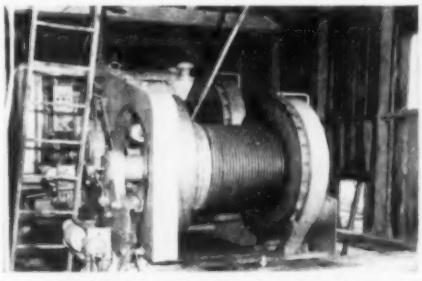
These low costs are achieved by using just one machine—the new Sauerman Slackline Cableway. Multiple equipment is not needed to supply your required tonnage. For example, on an average haul and digging depth, a single medium size machine will charge a 200 tph. plant.

The high Slackline mast permits building a large pile which can supply plant demands through a plate feeder and tunnel conveyor, front-end loader or clamshell. The new Sauerman torque converter diesel-hoist automatically matches power to load demands and is designed for continuous duty. Fluid drive cushions out shock loads to reduce fuel and maintenance costs, extend cable life.

Increasing land values and depleting resources make it necessary to get all the material out of your deposit. You can do this with a Sauerman Slackline. The machine will dig from ground level to deep under water and keep your plant running additional years at the lowest possible operating cost. Several pits are now operating Slacklines on 1000-ft. spans with average hauls of 500 to 700 ft. and from 100-ft. depths.

Write or call, giving your tonnage requirements, depth and length of deposit—if available. We will promptly supply more information on Slackline Cableways, and show you how to *save with a Sauerman.*

CONTROL IS REMOTE, EFFICIENT AND SAFE—Control station can be conveniently located at any strategic point in plant area. Operator can watch entire operation. Fatigue is minimized and personal danger eliminated.



TORQUE CONVERTER INCREASES PRODUCTION, CUTS MAINTENANCE—Now available, the new Sauerman Torque Converter Hoist automatically matches power to load, provides a smooth and steady flow of material, reduces fuel, maintenance and cable costs.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.

Linden 4-4892 • Cable CABEX–Bellwood, Illinois

Crescent Scrapers • Slackline and Tautline Cableways • Durolite Blocks

Closeup shows link (arrow) that holds jaws of the tongs open. Link is released by lowering the tongs over a pile and allowing a little slack in the hoist line.

News . . .

Continued from page 44

capacity of 100,000 pounds. To be on the safe side, the Gerwick firm ordered two pairs of the tongs, planning to use them in tandem if necessary, but did not have to use the extra pair.

Intended for use with ½-in. thick piling, the tongs have a maximum jaw opening of 6 inches.

The leverage of the tongs is designed to give a tighter grip as the pull is increased. The jaws are shaped to present a maximum bearing surface. For additional pulling power, each jaw has 15 teeth that help grip the sheet steel firmly, but without damage.

"In pulling over 600 piles, there was absolutely no slippage of the gripping surfaces," Supt. Tess reported. "At the end of the job, the tongs were still in perfect condition."

Tess said the tongs served as a natural plumb and centered themselves over a sheet pile. The tongs are manufactured by Heppenstall's materials handling division, which has its headquarters at New Brighton, Pa. The company, which is widely known as a manufacturer of die steels, industrial knives, and a general line of quality steel forgings, has its main plant and general offices in Pittsburgh.

The Crown-Zellerbach building will be a 21-story structure of glass and steel. Associated architects are the firms of Hertzka & Knowles, and Skidmore, Owings & Merrill, with H. J. Brunnier as structural engineer. The general contractor is Haas & Haynie. The foundation subcontractor, Ben C. Gerwick, Inc., is a subsidiary of the J. H. Pomeroy Co., Inc., of San Francisco.

Dravo Commissions Big Dredge

One of the largest sand and gravel-producing dredges on the nation's inland waterways was recently launched into the Ohio River at Dravo Corporation's Neville Island shipyard, near Pittsburgh, Pa.

The $2 million dredge, which is 201 feet long, 53 feet wide and as high as a six-story building, will enter service this month for Dravo's Keystone Div., one of western Pennsylvania's largest suppliers of sand, gravel and ready-mixed concrete.

The new dredge is known as Dredge 16 and will operate on the Ohio River below Montgomery Dam. Complete with its own heavy media plant, impact crusher and scrubber, Dredge 16 can produce four different grades of aggregate—sand and three grades of gravel—simultaneously at the rate of 500 tons an hour. It also can load four barges at once, either with the same or different grades of aggregate.

Powered by two 500-KW diesel-electric generators, the dredge is equipped with a 100-ft. long bucket ladder to reach the bottom of sand and gravel deposits in the river.

F. J. Lloyd, Jr., Dravo vice president and general manager of the Keystone Div., said the new dredge was built to meet the heavier current demand for large tonnages of sand and gravel in the Tri-state area and the expected increase in future demand for consistently high quality aggregates that will conform to more stringent building codes.

Dredge 16 replaces a smaller unit. Larger sizes of aggregate, previously wasted by the older dredge, can now be crushed and screened into the desired grades. Such impurities as coal, wood and other undesirable objects are removed during the processing, making it possible to utilize deposits that have been left untouched for years because of difficulties in converting them into quality material.

B-E Names Sales Officials

Lewis C. Black has been named vice president in charge of sales by Bucyrus-Erie Co., South Milwaukee, Wis. He had been manager of domestic sales since September 1958, and had previously served as sales manager of large machines and blast hole drills.

F. B. Shew

L. C. Black

Black was assigned to the firm's home office in July 1956, after serving as assistant eastern district manager in New York City. He joined Bucyrus-Erie in 1935, after graduating from Lehigh University with a degree in mining engineering.

Frederick B. Shew has been appointed sales manager for commercial cranes and excavators. Bucyrus-Erie's commercial line includes ⅜ to 4-yd. excavators and cranes.

Into the Ohio River at Pittsburgh, Pa., splashes one of the largest aggregates dredges on the nation's inland waterways. The 200-ft. dredge is tall as a six-story building.

Shew formerly was sales development manager, commercial cranes and excavators. He joined the firm in 1956 as a sales representative, following a six-year association with the Wellman Engineering Co., Cleveland, Ohio.

Introduce Bill to Push Interstate Program

A bill to keep the federal interstate highway program moving through the fiscal year 1962 was introduced in the Senate recently by Sen. Jennings Randolph (D-W. Va.).

The Randolph bill, if enacted, would:

1. Increase the 1962 interstate authorization from $2.2 billion to $2.5 billion, making it equal to those for 1960 and 1961.

2. Approve the 1958 cost estimate as the basis for making the 1962 apportionment.

3. Suspend the Byrd "pay-as-you-go" amendment for the fiscal years 1961-1962. This action would make it possible to make the full interstate apportionments scheduled to be made in 1959 and 1960. Under present law, it will be necessary to forego completely any apportionment of interstate funds during calendar year 1959 for the fiscal year 1961, and the apportionment during calendar year 1960 for the fiscal year 1962 would amount to only about $500 million.

"We have embarked on a vast program of improving the highways of our nation," Senator Randolph said in a statement made on the floor of the Senate. "We have made commitments to the states that we are under obligation to carry out. Many thousands of employees of contractors and suppliers of equipment and materials are depending on this program for their livelihood. Large amounts of highway rights-of-way have been purchased and people moved from their homes to make way for new highways. To curtail the program at this time would be uneconomical and a serious setback to the ultimate completion of our highway systems in which every citizen of our country has a high stake."

Pointing out that 34 state governors have gone on record as opposing any increase in the federal gasoline tax, Senator Randolph said that he does not believe that this is the time to increase taxes. Instead, he said, Congress should wait until 1961, when new studies by the Bureau of Public Roads on costs and benefits will be available, to reach "a satisfactory solution" to the highway financing problem.

NEWS ABOUT THE DUMP BODY BUSINESS

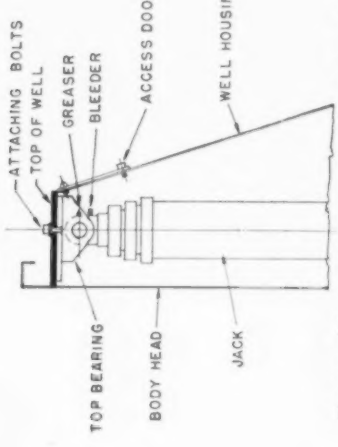
Increase Your Earning Power with MARION'S New Front End Hoist For 8, 9, 10 Foot Bodies

Another rugged and competitively priced Marion hoist is now available in three models for 8, 9 and 10-foot bodies. Outstanding features incorporated in the hoist provide time and performance saving benefits for all users.

- The method of attaching the cylinder to the body speeds up installation and allows fast, easy detachment for any servicing in the field (see diagram).
- The deep oil reservoir, mounted on the side, provides a quieter, cooler, more efficient hydraulic system and eliminates the danger of drawing air into the system
- Weight savings from 65 to 270 pounds
- Fast dumping speed
- Pump with safety relief valve.

Write for a bulletin covering the three models, F-5131-65-72-82.

MARION METAL PRODUCTS CO.
Marion, Ohio, U.S.A.



The top plate is connected to the top of the cylinder before the body is installed. Then as the body is let down, the cylinder will guide itself into place in the cylinder housing. The body is then secured from the outside at the top by two bolts that fasten the body to the top plate.

HEADQUARTERS FOR YOUR BEST BUYS IN USED EQUIPMENT!

Your Caterpillar Dealer's lot holds the best selection of used earthmoving equipment buys on the market. Here's why: His business is active—and he reconditions, classifies and guarantees his trade-ins so you *know* what you're getting. Here's how:

BONDED BUY

1 A **"BONDED BUY"** on used Cat-built equipment is your safest buy. It's a bonded guarantee, up to $10,000 of satisfactory performance on *all* parts during the guarantee period.

2 A **"CERTIFIED BUY"** covers units of any make in good condition. This type of protection carries your dealer's written guarantee of satisfactory performance.

3 A **"BUY AND TRY"** deal is just what its name implies. This protects you with your dealer's written money-back agreement.

Only Caterpillar Dealers offer this protection. You'll find your dealer listed in the Yellow Pages. For your best buys in used equipment, visit his lot today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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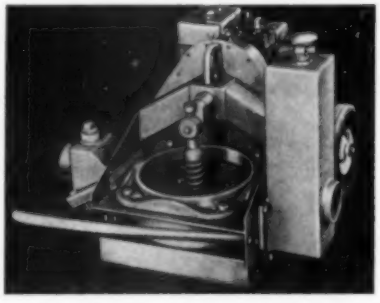
BEST BUYS IN NEW AND USED EQUIPMENT

Equipment You Ought to Know About

Diaphragm Pump Line



Manufacturer: Barnes Mfg. Co., Department EE, Mansfield, Ohio.

Claims: Barnes has completely redesigned and expanded its line of diaphragm pumps in the 1½ to 4-in. size range. The new line offers capacities from 3,500 to 6,000 gph at 5-ft. lifts. A variety of sizes, power drive options and capacities is available in the line. The pumps will handle almost all seepage and dewatering applications while offering all the convenience and economy features of compact, lightweight pumps.

The pump line has been designed with strength and lightweight compactness through the use of integrally fabricated frame, waterbox and drive bearing support units. This type of construction also results in less vibration, a lower profile for working in cramped quarters and easy transportability.

All models in the line have certain common features. Rubber-faced swing-type flap valve and replaceable discharge valve seats are easy to replace and provide free passage of solid foreign materials. Threaded suction connections are also easily and inexpensively replaceable. The diaphragm itself can be replaced with a standard open end wrench without tilting the pump or disturbing the hose.

Pump shafts and plunger eccentrics are equipped with anti-friction roller bearings. The discharge valve is fitted with a bottom cleanout plate and the air chamber has a threaded top opening for discharging or wetting the discharge valve.

All models are available on wheels or skids with a variety of options for gasoline or electric power or universal models furnished without power to utilize gasoline engines or electric motors presently owned by customers.

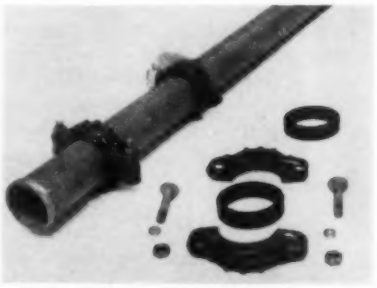
Standard models in the line are available in 1½, 2, 3 and 4-in. models. The 1½-in. model has a 2-in. discharge, is powered by a 2-hp Briggs 6BR6 gasoline engine, weighs 145 pounds on wheels and delivers 3,000 GPH at 5-ft. lift.

Variable power pumps are available in a 2-in. model with 3,500 GPH capacity and a 3-in. pump delivering 5,500 GPH at 5 feet. Pumps in this series are available with electric motors furnished by the company or without power but with gear reduction to adapt customer's power source. The company furnishes a 1-hp 3-phase, drip-proof 1,750 rpm electric motor with the 2-in. pump and a 1½-hp motor with the 3-in. model.

Lightweight Air Piping

Manufacturer: Atlas Copco Pacific, Inc., Department EE, 930 Brittan Ave., San Carlos, Calif.

Claims: Alvenius lightweight steel pipe, a standard component for compressed air and water lines in European construction and mining, is now available on the United States market for the first time through Atlas Copco Pacific.



A. B. Alvenius Industries, manufacturers of the Swedish piping, has selected Copco to sell the product throughout the 11 western states.

Initial distribution plans call for 2, 4 and 6 in. diameter pipe to be available here, in standard 5, 10 and 20-ft. lengths.

Principal advantage of the Alvenius pipe is its extremely light weight—approximately one-third that of standard steel pipe. Cold rolling from quality Swedish steel is said to have made pos-

Continued on page 50

GIANT PRODUCTION!
LOW-COST OPERATION!
GET 'EM BOTH IN THE MIGHTY D9!

From every angle the Cat D9 Tractor is a "take-charge" giant . . . capable of giant production. Here's 30 tons of steel engineered and manufactured into a rugged, reliable machine that refuses to falter when the going gets tough.

The heavy-duty, seven-roller track frame is built to take the punishment of heavy loads. "Hi-Electro" hardening of wear areas of the undercarriage gives extra dependability. Extra-strong frame and final drive form a backbone built for long life under the severest operating conditions.

The turbocharged D9 Engine puts out 320 HP at the flywheel. 'Dozing, pulling or pushing — this means peak production on any job. Despite its size and power, the D9 is easy to operate. Hydraulic boosters provide power for steering, braking and master clutch use. Finger-tip control helps keep the operator at top efficiency.

The D9 is easy and economical to maintain. The exclusive Caterpillar oil clutch operates up to 2,000 hours — one whole season — without adjustment. And it needs adjustment no more frequently than ordinary clutches need replacement. Proper track tension is quick and easy to apply with Cat hydraulic adjusters.

NEW FEATURES FURTHER REDUCE MAINTENANCE COSTS: Lifetime lubricated rollers and idlers — tested for 2½ million hours — need no servicing until rebuilding. New dry-type air cleaner removes at least 99.8% of all dirt and dust from engine intake air throughout every service hour. Cleaner can be serviced in 5 minutes; filter element re-used.

A complete line of attachments and scrapers make the mighty D9 a versatile profit-maker. Scrapers available for use with the D9 are the No. 463 Series C, which carries 22 cu. yd. struck, 28 heaped, and the No. 491 (27 cu. yd. struck, 34 heaped). Fast loading, efficient ejection and spreading step-up cycle time with either one. A full line of bulldozers and controls insures the right combination to handle any 'dozing job. Two rippers are available . . . the No. 9 for normal ripping and the Kelley Ripper with single tooth for extra-deep penetration.

These are just a few of the plus features found in the D9 Tractor — features that make the D9 "King of the Crawlers." The real proof is in a demonstration on your job. See for yourself. Call your Caterpillar Dealer now.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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GET TOP PRODUCTION WITH A TAKE-CHARGE D9

New Equipment . . .

Continued from page 48

sible a thin-wall pipe with a strength of 104,000 psi.

This favorable weight factor, coupled with a corrosion-resistant hot galvanized finish and simplified couplings, enables re-using Alvenius pipe on successive jobs with substantial overall savings.

Pipe ends are reinforced in the manufacturing process by a pressure-welded external ring, which also serves to hold the coupling firmly in position and to eliminate grooves or other internal obstructions that frequently are the cause of line turbulence.

Couplings allow for an angular deflection up to 10° in the line. Two types of couplings will be standard initially for United States sales—a split unit secured by side bolts and a one-piece snap-lock model. Each of these coupling assemblies includes a heavy rubber gasket for complete sealing.

Custom-Built Lube Vans

Manufacturer: Aro Equipment Corp., Department EE, Bryan, Ohio.

Claims: New custom-engineered Lube Vans are an effective way to combat downtime and extend equipment life on construction jobs.

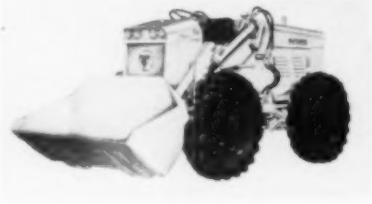
The Lube-Van provides complete lube service facilities in a compact mobile unit. Capable of furnishing around-the-clock lubrication on the road or in the field, it is equipped with air compressor and generator. It is completely engineered and factory-built for the specialized requirements of the individual contractor. Factors such as weather, terrain, types of heavy machinery to be lubricated, and oil company recommendations are carefully coordinated in the custom design of the unit.

An Aro field engineer works closely with the contractor and the oil company in planning details of the mobile unit. Drawings of the proposed Lube-Van are submitted. Details such as correct weight distribution are carefully watched. Truck and van specifications are recommended.

Equipment includes heavy-duty all-weather pumps and reels, specialized for contractor needs. The van has storage space for filters and other replacement parts; it also has flood lights for night work.

The van provides all required services —engine oils; gear, chassis and truck grease; hydraulic fluid; and water, air and solvent. An air hoist with trolley simplifies loading.

5,300-lb. Capacity Loader



Manufacturer: Tractomotive Corp., Department EE, Deerfield, Ill.

Claims: The new TL-14 TractoLoader incorporates special features designed for speeding excavating-loading work and easy operation.

The 14,480-lb. unit has a carry capacity of 5,300 pounds, maximum lifting capacity of 11,000 pounds and a breakout force of up to 17,800 pounds. Six buckets are available for use with the TL-14, ranging in size from 1 to 3 cubic yards. Choice of bucket depends upon the weight of the material to be carried in pounds per cubic yard. The heavier the material, the smaller the bucket capacity that should be used.

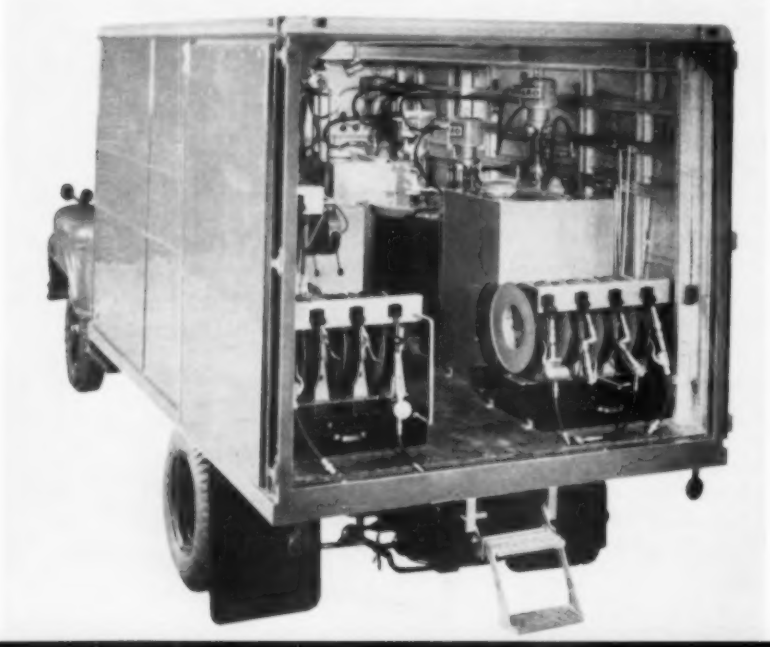
The ruggedly constructed buckets with wrap-around cutting edges tip back 42° at ground level for fast loading. For maximum stability while traveling, the bucket can be tipped back at an angle of 47° when only 14 inches above the ground.

Maximum dumping clearance under the hinge pin is 10 feet 5 inches. Depending upon the bucket used, dumping clearance under the bucket cutting edge ranges from 8 feet 3 inches to 8 feet 5½ inches. At maximum dumping height, reach from the front of the tires to the cutting edge varies from 2 feet 11 inches to 3 feet 7 inches. From the front of the frame, the reach is 2½ inches greater.

The TL-14 TractoLoader is powered by either an 86-hp 6-cylinder Allis-Chalmers gasoline engine or an 81.5-hp diesel. It has a three-speed full power-shift transmission. Only one lever controls all speeds in both forward and reverse. Top travel speed in either direction is 26 mph. The unit has a 3.5 to 1 torque converter.

Easy and safe to handle, the unit has rear wheel power steering and four wheel power brakes that can be operated by either the right or left foot. It is also equipped with a separate positive locking mechanical parking brake.

The TL-14, like the six other TractoLoader models, is sold and serviced by Allis-Chalmers construction machinery dealers.



Power Unit Package

Manufacturer: Industrial Engine Div., Department EE, Ford Motor Co., P. O. Box 608, Dearborn, Mich.

Claims: Introduction of four new power units, which give the Ford industrial line a full complement of power unit combinations for its diesel and gasoline industrial engines has been announced by Ford.

The Ford power units are fully equipped with sheet metal housing and instrument panel, electrical system, radiator assembly, skid-type mounting and other components which make the unit ready for its industrial job.

The new power units are built around Ford's 330-cu. in. six-cylinder diesel engine and the three new Super Duty gaso-

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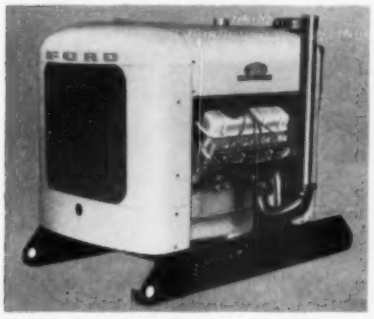
line engines of 401, 477 and 534-cu. in. displacement. Ford already offers power units for its other diesel and gasoline-powered industrial engines, beginning with the 134-cu. in. engine.

The compactness, durability and



ready parts and service availability have made the Ford industrial engines popular with many types of industry. All Ford industrial power units are available with special attachments—transmissions, torque converters and SAE housings—which permit customized installation in most cases.

The Ford industrial engines and power unit line, marketed through Ford industrial products dealers from coast to coast, now includes the "220" and "330" diesels, two four-cylinder, one six-cylinder and five V-8 gasoline engines, and power units for each engine.

Poison Ivy Preventives

Manufacturer: E. D. Bullard Co., Department EE, 2680 Bridgeway, Sausalito, Calif.

Claims: Imunivy and Imunoak are standardized non-toxic alcoholic extracts of poison ivy or poison oak. When taken as directed, they will eliminate or reduce substantially the incidence of poison ivy or poison oak.

These products have been sold by the Bullard company for over 30 years. It has been estimated that they are between 80 and 88% effective. Because no two individuals are exactly alike, the extent of benefits secured from Imunivy and Imunoak vary.

The products can be given orally or injected intramuscularly by a physician. The majority of the companies using these products make them available in the early construction season. They are taken one vial in ⅓ of a glass of water, milk or fruit juice, two days in a row, followed by one vial every month until frost destroys the plants in the fall of the year. A number of companies prefer having their employees take the

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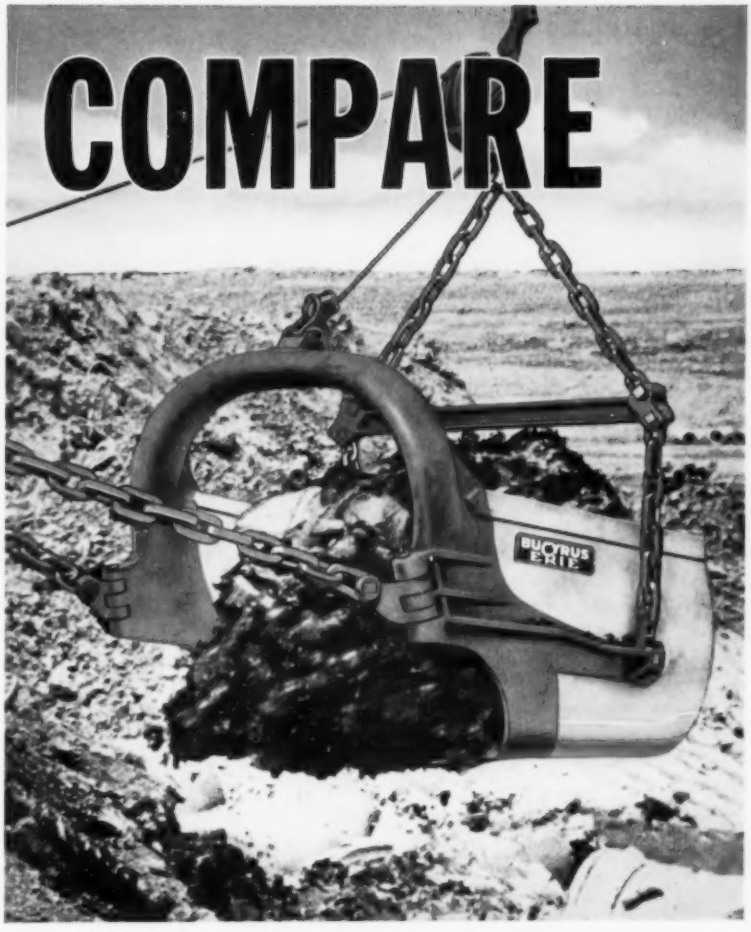


...and you'll buy BUCYRUS-ERIE

compare output Watch the "slicing action" lip take a faster bite, regardless of material . . . watch the tapered basket fill smooth and fast . . . watch it ride through the swing, smooth and even without bobbing and spilling . . . and watch the high-speed dump made possible by a clean inside design and high arch!

compare economy Ask others about long-life Bucyrus-Erie buckets! BECOLOY — a specially developed Bucyrus-Erie alloy — not only makes the buckets lighter, but adds great strength and wearing ability with higher impact resistance.

Your Bucyrus-Erie distributor will give you complete information on the complete line, all types, including solid and perforated; light, medium and heavy-duty. Call him today, or write Bucyrus-Erie Co., South Milwaukee, Wisconsin, Dept. 1RE.

BUCYRUS ERIE® *Builds Better Equipment*

New Equipment . . .

Continued from page 51

products in the spring and in the fall, while others use it monthly the year around.

No one can assume that he is immune to poison ivy, poison oak or poison sumac. Human beings are not naturally sensitive to the poison in the plants' sap, and do not develop a rash on their first contact with it. Sensitivity is created by repeated contacts. It is practically impossible for anyone who works where poison ivy, oak or sumac grow to avoid contact with it. Though an individual may avoid the plant, he may become infected from clothing, tools, animals, and at times from another person.

Some form of the offending family of plants — Rhus Toxicodendron — is found in every part of the United States. During 1958 it was estimated that more than 600,000 man days were lost to this irritation.

Turbocharged Tractor

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: A new D7 tractor has been announced by Caterpillar. Featuring greater power, decreased maintenance requirements and higher lugging ability, it is designated the D7 Series D tractor.

The new machine becomes the third crawler in the company's line to be powered by a turbocharged engine—joining the D9 and D8 tractors. The D7's engine develops 140 flywheel horsepower, an increase of more than 9% over the 128 rating of its predecessor. Drawbar horsepower has been increased from 102 to 112.

A factor significant to increased production is the new D7's substantially increased lugging ability. Contributing to this is the higher torque rise of the engine. The tractor offers 19.6% increase in drawbar pull as the engine lugs down under the load, which is 80% greater lugging ability than the previous model—the highest in the D7 class. An example of this characteristic may be drawn by comparing its rated and maximum drawbar-pounds pull. In first gear, the tractor is rated at 27,100 pounds drawbar pull. However, under load the drawbar pounds pull increases to 33,250, a rise of 6,150 pounds.

The engine's high power-output provides more horsepower per pound of tractor weight than any crawler in its size class.

More efficient intake-air filtration and reduced servicing time are also afforded the engine by use of Caterpillar's dry-type air cleaner.

Other new D7 features reducing service time are lifetime lubricated rollers, carrier rollers, and idlers with the exclusive floating-ring seal. Built to keep dirt and contaminants out and lubricant in, the rollers and idlers are lubricated during factory assembly. They need no further lubricant until rebuilding.

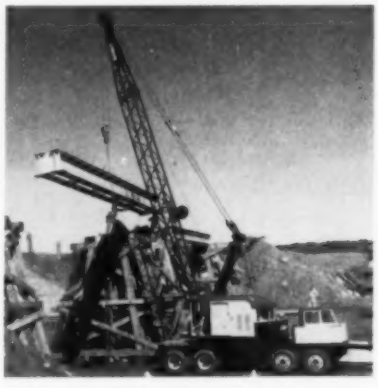
Compared with the previous D7 rollers, the new ones have 25% greater beam strength, 10% larger shaft diameter, a 17% thicker thrust flange and 2.8% more bearing area.

Power train components also show refinement over the previous D7. The transmission lubrication system has full flow filtration, with pressure-lubricated bearings. To assure maximum lubrication of transmission gears, they operate under a continuous spray of oil.

The pitch of final-drive gears has been made coarser, to provide beam strengths 16% greater in the idler pinion, and 49% greater in the final drive gear.

In-seat starting is available as an optional attachment.

30-Ton Mobile Crane

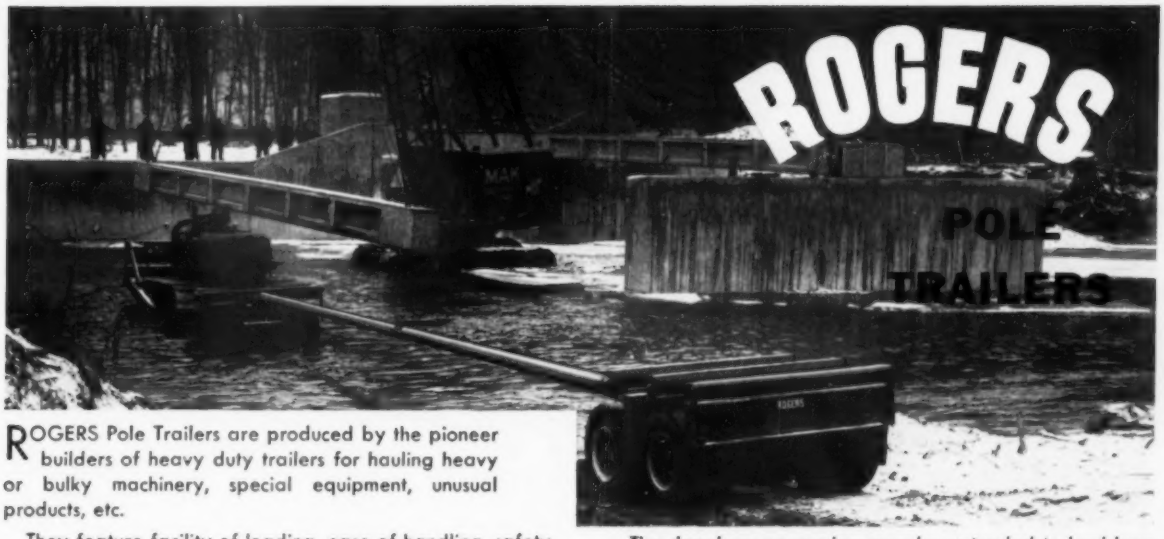


Manufacturer: Thew Shovel Co., Department EE, Lorain, Ohio.

Claims: Thew Shovel has added a new 30-ton, 8x4 Lorain Moto-Crane to the firm's line of rubber-tire shovel-cranes.

The carrier for the new Moto-Crane, is designed and built by Lorain for the specific size and type of shovel-crane. One of the most distinctive features of the MC-430 carrier is the rocker beam mounted front bogie that doubles the front axle carrying capacity. When heavy loads are carried suspended from the boom over the rear, this type of

"This one is completely bulletproof for dozing roads through property of belligerent farmers."



ROGERS Pole Trailers are produced by the pioneer builders of heavy duty trailers for hauling heavy or bulky machinery, special equipment, unusual products, etc.

They feature facility of loading, ease of handling, safety of control and ruggedness.

In addition to rugged construction throughout including the use of large brakes and heavy duty roller bearings, versatility is a feature of these Roger Pole Trailers.

They have been in use for decades hauling long, unwieldy products including steel beams, iron bars, smoke stacks, special equipment, coast defense guns, etc.

With the development of prestressed concrete beams Rogers Pole Trailers were proven to meet the unusual requirements of this type of hauling.

The drawbars or reaches may be extended to haul long objects and then telescoped to permit fast return trips with a shortened overall length.

To the front section is welded a bar containing holes at intervals into which a pin in the locking cap is inserted.

This permits lengthening or shortening the drawbar in increments of two feet. Or, if found desirable, the reach can be removed entirely and rigid, self supporting objects lashed to the front bolster and its after end secured to the trailer bogie.

Note the various features then write for prices and any additional information desired.

If you have a new hauling requirement send the facts and we will submit recommendations without charge or obligation.

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construction gives better steering because the additional weight of the front end increases the load and "steerage" on the steering wheels. Also the carrier tends to follow the steering wheels better and to eliminate the tendency to bulldoze a rut in soft ground. Better axle loadings are achieved for over-the-highway travel as well.

Other carrier features are 8-wheel brakes; 15 forward speeds to 47 mph; and hydraulic power-assist steering.

The turntable that is attached to the carrier with Lorain's maintenance-free Shear Ball mounting, can be located in three different positions for best operating advantages. These changes can be made easily in the field for maximum crane lifting capacities, best digging ranges or for general purpose work.

Precision boom lowering device is standard. Precision load-lowering and third drum are available.

A power-operated folding mast gantry lowers below cab height for minimum clearance for highway travel. The boom is lightweight square-tubular-chord design. The weight saving is reflected in additional lifting capacities and greater ranges.

Flotation Tires for Graders

Manufacturer: Harmo Tire & Rubber Corp., Department EE, 1050 18th st., Detroit 16, Mich.

Claims: Harmo "flotation" tire and wheel or tire and rim assemblies are specially designed for use with graders, loaders and other heavy off-the-road equipment.

WB-22 flotation tires will fit Caterpillar, Austin Western, Adams and other motor graders, and Hough, Case, Michigan, Trojan, Koehring and other power loaders.

The flotation tires are claimed to give twice the ground contact area of conventional tires and enable heavy equipment to operate without stalling on extra steep slopes (up to 40%), or in loose sand, heavy muck or other adverse operating conditions.

Flotation tires have flexible sidewalls, as in airplane tires, and are operated at extremely low pressures (12 to 20 pounds). As a result, they spread out under load to literally float the equipment over difficult terrain. The need for crawler assistance is eliminated, even in

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New Equipment . . .

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working with full blade over a series of sand slopes.

Conforming closely to the surface of the terrain, the flotation tires also reduce spinning of the driving wheels under heavy load. The increase of traction over conventional tires is estimated at 40 to 60%, with resultant fuel savings and reduced tread wear.

The increase in contact area and lower pressure also produce a softer ride, lessening driver fatigue and promoting longer equipment life.

Flotation tires do not change the gear ratio or otherwise affect the operation of the equipment.

Harmo WB-22 flotation tires are supplied complete with tube and wheel or tube and rim assemblies for mounting on hub or wheel of virtually all makes of grader or loader. The tires are 16-ply or 20-ply nylon with extra-wide sectional width (19.92) and rim (17.92 and 20). Contact area is 466 square inches. Load rating is 7,000 pounds at 15 pounds pressure.

Sinker Drill

Manufacturer: Chicago Pneumatic Tool Co., Department EE, 6 E. 44th St., New York 17, N. Y.

Claims: A new heavy-duty sinker drill combining a revolutionary "Beavertail" retainer with an all-new front head assembly has been developed by Chicago Pneumatic.

A capable and versatile tool, the CP-69 is the first sinker drill in the 55-pound class to use the Beavertail design. Key element in the assembly is a trouble-free, compressible rubber cushion which has eliminated retainer springs. Consequently, costly replacement of worn springs is eliminated. In addition, contact between the drill steel

and the retainer collar has been substantially increased, minimizing retainer wear.

Another feature of the CP-69 is an all-new front head assembly in which vital chuck parts have been redesigned and safely enclosed within a protective, one-piece sleeve.

The entire assembly can be rotated 180°. This feature—enabling the operator to place the retainer latch in the most convenient position for the particular job—makes the CP-69 versatile for either lateral or overhead airleg operation, or hand-held downhole work.

Versatility is increased by an all-purpose universal backhead which permits operation by any one of four methods with only minor adjustments. Changeover of the backhead to any of these methods—dry, blower dry, wet or air-water—can be made quickly and inexpensively by a simple valve transfer.

Off-Highway Haulers

Manufacturer: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Claims: Two new International Payhauler rear-dump off-highway trucks —featuring powerful new International diesel engines and exclusive corrugated bodies—now are in production.

The units are the model 95 Payhauler, with a struck capacity of 18 cubic yards and a 27-ton payload, and the model 65 Payhauler, with a struck capacity of 12.5 cubic yards and a 19-ton payload.

Powering both "95" and "65" Payhauler trucks is the most powerful diesel engine ever built by International Harvester—the 817.

The larger Payhauler is equipped with the turbocharged version, the DT-817, with a maximum horsepower rating of 375 at 2,100 rpm. Displacing 817 cubic inches, the six-cylinder, four-cycle, direct-starting engine has a 5⅜-in. bore and a 6-in. stroke. The compression ratio is 16 to 1.

For the model 65 Payhauler, there is the naturally-aspirated D-817 engine, developing 250 maximum horsepower at 2,100 rpm. Incorporating many new design parts and systems, the D-817 is a high-output, heavy-duty engine designed especially for vehicles such as Payhauler trucks.

The corrugated bodies of the "95" and "65" Payhauler models eliminate deadweight drag, while speeding pay dirt faster and with greater profit.

Body deadweight is reduced 30% without sacrificing strength. Floors, side and front sections are formed of ⅜-in. corrugated abrasive-resistant steel plates. Wear floors are joined to corrugated subfloors that provide passageways to heat the body.

Like similarly-constructed railroad gondola cars, the rock-ribbed corrugations absorb rock shocks while resisting wear and distortion.

Speeds up to 38 mph, to match all loads and roads, are obtainable with the model 95 Payhauler. There is a choice of torque converter with power-shift, or nine-speed air-shift transmission.

The "65" Payhauler—the only 19-ton, off-highway truck on the market —delivers speeds up to 36.46 mph through a 10-speed constant-mesh transmission. Both units offer fast reversing (up to 7.1 mph in the gear-drive model 95) to speed spotting or positioning for dumping.

Power steering gives greater ease of operation, and vibration-free steering results from the large rib tires on both models. Thus, side slippage on turns is reduced drastically.

Many new cab comfort and driver safety features have been incorporated in the Payhauler trucks.

There is a large adjustable seat; a 68% larger tilt-forward, non-glare windshield with 23% more window area; six large vents for hot weather comfort; and improved braking for faster stops, including Torqmatic brake on the "95" for greater downgrade safety.

Both Payhauler trucks are available in either Federal yellow or International Harvester red—both high-visibility colors.

Vibratory Compactor for Payloaders

Manufacturer: Frank G. Hough Co., Department EE, 708 Seventh Ave., Libertyville, Ill.

Claims: A new vibratory compactor attachment is available for all four-wheel-drive Payloader tractor-shovel models. This self-contained and self-powered attachment uses the durable, efficient and well-proved Jackson electric system and can be interchanged with the bucket in a matter of minutes.

A heavy-duty, air-cooled motor and generator unit drives electric-motor vibratory units on four compactor pads. Each of the pads delivers up to 4,200 three-ton blows per minute. The compaction results meet most Proctor density specifications for granular materials.

The compaction unit is recommended for granular soil sub-bases and the base courses of sand, gravel, rock or slag in waterbound and penetration macadam construction.

The total compacting width of the unit is 10 feet. This width extends beyond the Payloader tread and permits compaction close to side walls and borders. Any of the four shoes can be quickly detached from the mounting and used as a manually-guided, self-propelled unit to compact hard-to-reach areas.

The regular hydraulic boom control of the Payloader raises and lowers the attachment. All operating compactor controls are handled from driver's seat to facilitate ease of operation.

360-Hp Tournapull

Manufacturer: LeTourneau-Westinghouse Co., Department EE, Peoria, Ill.

Claims: A new 360-hp model B Tour-

Continued on page 56

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Wherever you go, wherever you see excavating or handling of materials . . . there you will find one or more OWEN Clamshell Buckets on the job. Faith in their performance, confidence in their sturdy construction, and complete assurance in their ability to complete contracts satisfactorily and "on time" . . . these are the reasons that powerful, rugged OWEN Clamshell Buckets dot construction jobs all over the globe.

You'll get more from an OWEN in every way — Longer Life, Larger Loads, More Economical Operation. From drawing board to finished product, OWEN lives up to its great name in every way. Put the real worker on the end of the boom! — get a Great OWEN Clamshell Bucket without delay.

OWEN MATERIAL HANDLING BUCKETS

OWEN'S new center line reeving principle, now incorporated in a completely redesigned line of material handling buckets, is one factor that increases cable life of these buckets up to 75%. A full line now available from ¼ cu. yd. up to 10 cubic yards.

OWEN GRAPPLES

OWEN'S patented independent tine action 4-prong grapple has proven itself invaluable in land clearing operations. Its independent tine action guarantees positive contact and tremendous gripping power on each of the four tines, no matter how irregular the shape of the object may be.

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New Equipment . . .

Continued from page 55

napull has been announced by LeTourneau-Westinghouse. A new transmission is also offered for this machine.

The new engine is a GM Diesel turbocharged six-cylinder two-cycle diesel. This engine, the GM 6-110T, is available in combination with either a special Allison torque-converter transmission, or the newly offered step gear transmission.

The 360-hp engine has a turbocharger that was not previously available for the two-cycle engine in the B Tournapull. The diesel unit gives a greater power output because of improved compression and exhaust characteristics. Company officials point out that the other optional 335-hp engines for the model B are still available for normal, average conditions, and the new 360-hp unit is for those conditions requiring more power.

The special Allison torque-converter transmission permits altering gear ratios to provide a better selection of speeds.

The new heavy-duty step-gear transmission, which is also available, is a smoother and easier shifting unit. This is made possible by the elimination of the shifting lever on the auxiliary gear box. Only one lever is used by the operator to shift the main transmission, since the auxiliary gear box is air actuated.

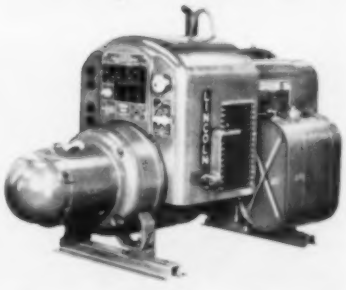
The B Fullpak scraper remains at its struck capacity of 21 cubic yards and 28 cubic yards heaped.

Standard equipment on the scraper is a quick drop mechanism on the bowl lift. This feature saves valuable seconds when handling tough-to-load, loose "dead" materials by enabling the operator to "pump in" the load.

As with the other size Tournapulls, the B Fullpak scraper is readily interchangeable with other trailing units designed for use behind the prime mover.

In addition to the scraper, there are currently available a 35-ton rear dump and a 30-ton crane.

Welder-Generator

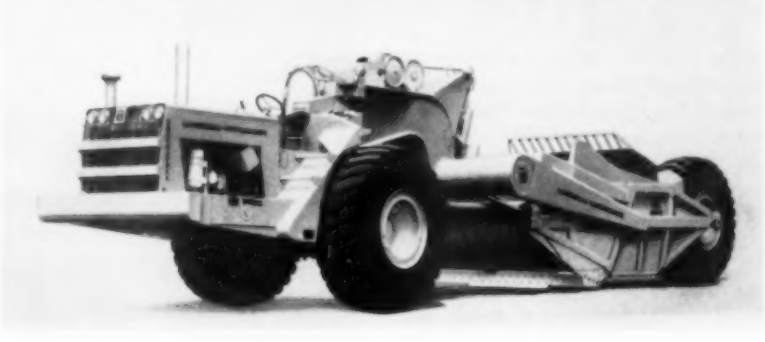


Manufacturer: Lincoln Electric Co., Department EE, Cleveland 17, Ohio.

Claims: A combination AC power supply and AC arc welder has been announced by Lincoln Electric. The new "Weldanpower" machine serves as 5-KVA power supply for use in the event of commercial power failure or where commercial power is not available. In addition, Weldanpower is a 200-ampere AC welder.

The unit has a heavy-duty Wisconsin air-cooled, 4-cycle model TFD engine. It delivers 13.1 hp at 2,000 rpm. Low engine speed reduces engine wear and extends engine life.

The Weldanpower provides 115 or 230-volt, 60-cycle, AC single-phase power. It is rated 5-KVA, continuous duty. The load can be connected to the machine at the outlets provided on the control panel. The four 115-volt receptacles are located on the left-hand side of the panel and the 230-volt receptacle is located on right. The 230-volt plug is furnished. The receptacles used on the generator lock conventional flat blade plugs in place. Maximum continuous current at 230 volts is 18.2 amperes. The machine will start and run motors as large as 3 hp. The speed, when used as a power supply unit, is 1,820 rpm.



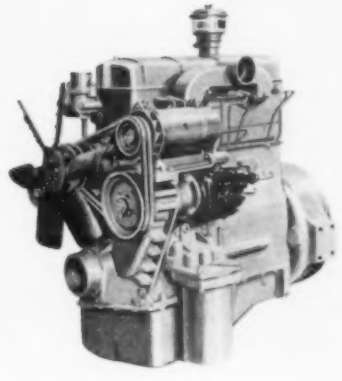
Weldanpower supplies 20 to 200 amperes of AC welding current for maintenance welding and hardsurfacing. Five taps with a rheostat for intermediate settings provide accurate, continuous current control. The machine handles 5/64-in. through 3/16-in. electrodes. Engine speed, when set for welding, is 2,100 rpm.

Separate windings for the welding and power circuits makes it possible to weld and supply power at the same time when necessary. You don't have to stop the engine or handle high voltage switches to change from one to the other. Also, all controls are mounted on the outside of the welder, readily accessible for easy use.

Weldanpower is compact and portable. It only weighs 537 pounds and can be carried in trucks, wagons or even the back of a station wagon.

Electrode and ground cables, head shield and lenses, electrode holder and ground clamp are included with the machine. Undercarriages for road towing or shop use are available as optional equipment at a slight extra cost.

Small Diesels



Manufacturer: Cummins Engine Co., Inc., Department EE, Columbus, Ind.

Claims: Cummins has introduced two new diesel engines—the 70-hp model J-70 and the 80-hp model J-80.

The engines are designed for such applications as light trucks, crawler tractors, pumping systems, shovels and cranes, graders, rollers, air compressors and generator sets.

The Cummins engines are designed to bring the benefits of diesel engine economy to equipment which previously was powered almost exclusively by gasoline engines. Field tests show that the J-70 and the J-80 can reduce fuel costs up to 65 or 70 cents per hour over gasoline engines doing the same type of work.

In addition to fuel economy, operator benefits include low maintenance costs and long engine life. Six-cylinder smoothness is offered with the unquestionable advantage of four-cylinder economy.

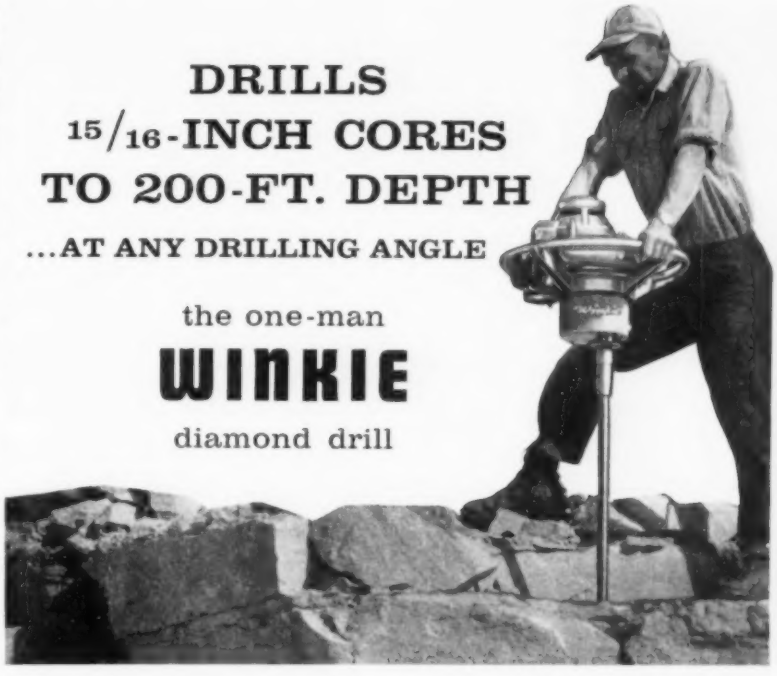
The engines are four-cycle, naturally-aspirated models of 4 1/8 x 5-in. bore and stroke, with 267-cu. in. piston displacement. The J-80 develops its rated horsepower at 2,500 rpm while the J-70 is rated at 2,000 rpm.

Both engines have five main bearings of 3 7/8-in. diameter. They have extra large 2 5/8-in. diameter connecting rod journals, 1 1/2-in. diameter piston pins and five camshaft bearings. It is believed the J-70 and the J-80 have the largest bearing area of any current production diesels of comparable size. They feature easily removable wet type cylinder liners which make "in frame" overhauls practical.

The J-70 and the J-80 are ideal for repowering many gasoline-powered units, and such conversions can be made with reasonable ease.

DRILLS
15/16-INCH CORES
TO 200-FT. DEPTH
...AT ANY DRILLING ANGLE

the one-man
WINKIE
diamond drill



So powerful, yet so portable — The new Bucyrus-Erie Winkie diamond drill weighs only 45 pounds, yet even in granite, the Winkie recovers 15/16-inch cores to depths of 200 feet. Maximum core diameter is 8 inches.

Low initial cost — The Winkie sells for half the cost of drills with equal capacity — is not limited to single purpose or a few drilling chores. The Winkie will take on almost any core or structural drilling job, finish it faster . . . cheaper . . . easier.

Lowest operating cost — The Winkie's easy-starting, 2-cycle, 5¼-hp gasoline engine will operate at full throttle, full load on less than a gallon of fuel per hour.

Whatever your job, the Winkie will give you greater footage per shift — for less cost — than any drill of comparable capacity. Write Dept. 21B59, Bucyrus-Erie Company, Drill Division, Richmond, Indiana, for complete details on the amazing big-capacity, lightweight Winkie.

45 lb.
2-cycle, gasoline, air-cooled engine
5¼ hp @ 5000 rpm
Hardened helical transmission gears
Gravity and hand lever feed
Centrifugal clutch
2000 rpm max. bit speed
Height, 19 in., Diameter, 21 in.

BUCYRUS ERIE®
BUILDS BETTER EQUIPMENT

NOT in the Contract

Psychiatrist: "What do you dream about at night?"

Player: "Baseball."

Psychiatrist: "Don't you dream about anything else?"

Player: "Nope, just baseball night after night."

The doctor looking puzzled: "Don't you ever dream about girls?"

Player: "What! And miss my turn at bat?"

Mistress: "When you wait on my guests tonight, be careful not to spill anything."

Maid: "Don't worry, ma'am, I won't say a word."

Sales manager: "What's this huge item on your expense account?"

Traveling salesman: "Oh, that's my hotel bill."

Sales manager: "Damn it all, don't buy any more hotels."

Customer: "Have you any four-volt two-watt bulbs.

Clerk: "For what?"

Customer: "No, two."

Clerk: "Two what?"

Customer: "Yeah."

A wealthy Texas oilman cashed a huge personal check which came back from the bank with "Insufficient Funds" stamped across its face. Beneath the stamped words was the handwritten notation: "Not you—us."

A general and a colonel were walking down the street. They met many privates and each time the colonel saluted he would mutter, "The same to you."

The general's curiosity soon got the better of him, and he asked, "Why do you always say that?"

"I was once a private," answered the colonel, "and I know what they are thinking."

EXCAVATING ENGINEER

"There's a little wobble here—are you sure this square is accurate?"

After the family had increased to three, it was decided to employ a girl as nursemaid.

"My husband is very particular whom we engage," said the mistress to the girl who applied for the job. "Are you faithful? Have you a kind and loving disposition? Will you . . ."

"Excuse me, madame," said the girl. "But am I to take care of the baby or your husband?"

The superintendent was complaining about filling the vacancies on his staff.

"It used to be," he said, "that when engineering graduates made application, we asked them to enclose a picture. Nowadays, they ask me to send mine."

Little Johnny had acquired the habit of using profane language, so his mother told him if he used a bad word again she'd pack his clothes and turn him out.

But habit was strong and Johnny forgot himself, so his mother immediately bundled his clothes and put him out of the house.

He stood outside for almost an hour with his mother watching him. Finally she opened the door and asked him why he did not leave.

"I was wondering," he said, "where the hell I would go."

An old lady went to a tombstone cutter's office to order a stone for her husband's grave. After explaining that all she wanted was a small one with no frills, she told him to put the words, "To My Husband," in a suitable place. Upon delivery, to her horror, she saw the words: "To My Husband in a Suitable Place."

A terribly jealous woman developed the habit of subjecting her husband to a regular inspection every evening. The slightest hair discovered on his coat would lead to the most frightful of scenes.

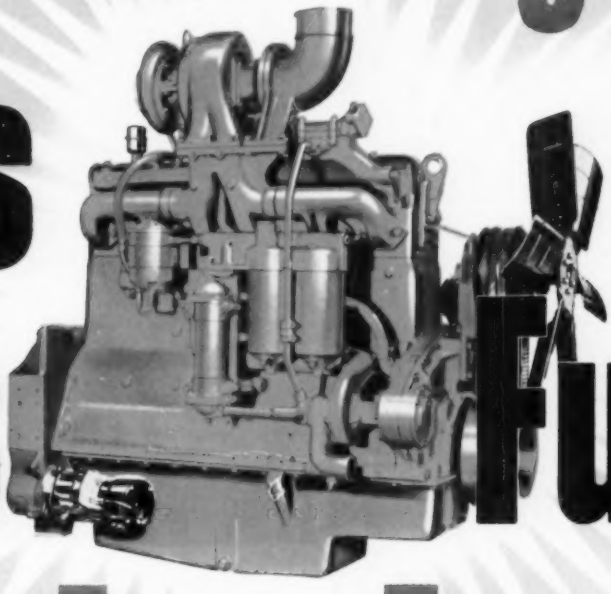
One night, finding nothing at all, she burst into tears and wept: "Even bald women now!"

A foreman had tried every strategy in the book, in a fruitless effort to spur a particularly lazy laborer to do an honest day's work. Finally he turned, in desperation, to the patriotic approach.

"You should be ashamed of yourself," he said, approaching the man. "Civilization is on the brink of disaster. Everyone is supposed to do his share to ease the world crisis, and here you are loafing."

"Oh," said the lazy one, "I'm not loafing. I am doing my share to relieve world tension."

This New Engine Uses Less Fuel Than Any Engine In Its Class



The new Allis-Chalmers 21000 turbocharged diesel engine delivers 340 dynamic horsepower at 2000 rpm — and does it on only ¾ of a cup of fuel, or just .355 lb, — per bhp/hr.

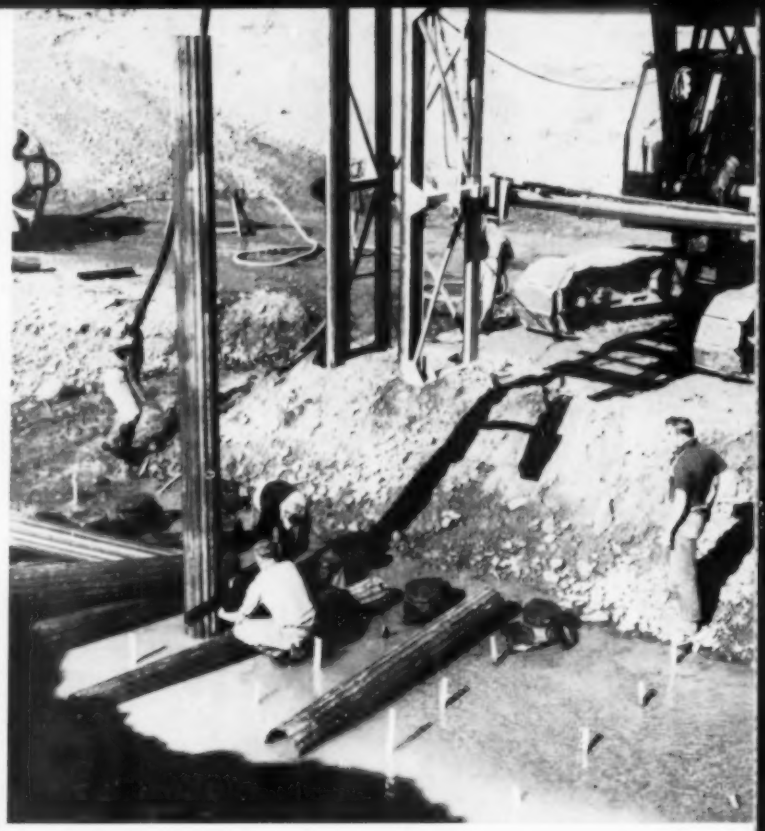
The comparable engine with the next best fuel economy, by published claim, burns between .39 and .40 lb, or almost 10% more.

Another engine in this class burns, according to published claims of the manufacturer, .46 lb per bhp/hr — or 29% more. This means 3 extra gallons to every 10.

The Allis-Chalmers 21000 and companion 16000 (naturally aspirated) engines deliver superior performance because of superior, *advanced* engineering—at least two full years ahead. The famous Allis-Chalmers durability and lugability are still included, too — only more so. Let your nearby Allis-Chalmers dealer show you. Allis-Chalmers, Milwaukee 1, Wisconsin. BE-16

ALLIS-CHALMERS

***POWER* FOR A GROWING WORLD**



(Left) Piledriver prepares foundation for bridge pier at Brodhead Creek crossing. A 900-cfm Chicago Pneumatic compressor supplies air for the hammer. (Above) The 60-ft. long corrugated metal tubes are driven to hardpan; then the crew measures the cutoff point.

(Below, left) Sheepsfoot rollers pulled by a Cat D8 tractor compact dirt fill for a roadway section. (Right) Fill material comes from a cut near the Delaware Water Gap interchange where a 2½-yd. 54-B shovel loads Euclid bottom-dumps. Five Euclids make the short haul.

(Left) Link-Belt crane pours ready-mix concrete for a large box culvert. (Right) Workmen empty ¾-yd. bucket into form for roof.

Morrissey . . .

Continued from page 43

88-B. The shovel is powered by a Cummins diesel engine with torque converter. The dolomite yields surely but reluctantly to the insistent urging of the big shovel dipper.

The 88-B loads into five 17-yd. Euclid end-dumps, which haul down a steep grade to a fill in the Water Gap interchange area.

Blasted rock for the shovel was being provided by an Ingersoll-Rand Drillmaster and two I-R Tractairs. The Drillmaster was putting down 6½-in. holes on a 14 to 20-ft. spacing. The Tractairs were drilling 3½-in. holes in hard rock. Rinehart was experimenting with various types of explosives in the holes, including ammonium nitrate, in an attempt to improve fragmentation.

Other equipment in the cut included a D6 and two D8 bulldozers, a sheepsfoot roller and compactor.

Five 17-yd. Euclid end-dumps and five 18-yd. Euclid bottom-dumps were assigned to cut No. 2 to haul material excavated by two shovels to a fill adjacent to the railroad. The shovels were a 2½-yd. Bucyrus-Erie 54-B and a 3½-yd. P & H 1055. Helping out were a D9, a D7 and a TD-24 dozer.

Drilling in Cut No. 2 was being done by the Drillmaster or a 4½-in. track-mounted Joy, or both as needed.

No. 3 is primarily a dirt cut that yields an abundance of boulders for two Bucyrus-Erie shovels—a 54-B with a 2½-yd. dipper and a 51-B with 2-yd. dipper. Five Euclid end-dumps were working under each shovel. Cat 80 wagons were utilized for some of the short hauls. Hauls on all three cuts were averaging about 2,500 feet, Rinehart said.

Also assigned to No. 3 were D8 and HD-20 bulldozers, an old Bucyrus-Erie 250 scraper pulled by an HD-21, a Cat 90 scraper pulled by an HD-21, and a TD-24 pusher with ripper.

Drive Piles

A 51-B was driving 88 metal piling tubes, each 60-ft. long, at the Brodhead crossing on the eastern end of the job. A Chicago Pneumatic 900-cfm compressor supplied the air. A 10-in. Jaeger pump was working hard to keep the area dry.

Two big Euclid water wagons were being used to execute a continuous sprinkling program.

Rinehart keeps his spread working one nine-hour shift five days a week. His staff includes Jim Moor, engineer; Walter Bishop, office manager; and Walter Jarvis, chief mechanic.

The Stroudsburg Bypass will have 24-ft. lanes in each direction, stabilized 10 and 12-ft. shoulders, and 4 to 20 feet of median, either raised concrete or grass. A typical mainline section of the roadway will show a 10-in. reinforced concrete surface and a 6-in. crushed stone base.

Travelers are anxiously awaiting the finished product.

New Trade Literature

Subject: **One-Man Trencher**

Content: The Arps model M-A Trench-Devil—a one-man operated trencher for gas lines, water services, foundations, electrical and telephone cable, street lighting and signal and sprinkler systems—is described in a 6-page bulletin. Equipped with a hydraulic clutch and self propelled, the model M-A digs trenches 2¾ to 8 inches wide and up to 54 inches deep. It offers digging speeds to 1,200 feet per hour in either direction. A reversible rubber-belted conveyor deposits dirt to either side.

Where to get: Arps Corp., Department EE, New Holstein, Wis.

Subject: **DragScraper Method**

Content: A new Sauerman field report shows how to extend dragline range and handle some difficult jobs. Line drawings and photographs of dragline-cranes equipped with Sauerman Crescent DragScrapers are shown in a variety of long range excavation work. The report shows how the reach of any dragline-crane can be greatly increased by using the hoisting line as a track cable for a DragScraper and carrier assembly. So equipped, the machine's range is limited only by the spooling capacity of the drums. Large machnies can usually double their rated bucket size with a DragScraper; smaller units can use about a half size larger. This is possible because the Crescent is much lighter, size for size. In addition, the bottomless Crescent hauls at ground level and deposits its load automatically when lifted by the crane. Ask for field report No. 231.

Where to get: Sauerman Bros., Inc., Dept. EE, 622 S. 28th Ave., Bellwood, Ill.

Subject: **A-C Diesels**

Content: Design, construction and mechanical advantages of the two recently introduced Allis-Chalmers power plants—the 21000 and the 16000 diesel engines—are described in a new 16-page Allis-Chalmers catalog now available from the Engine-Material Handling Div. It is complete with many illustrations, including charts, graphs and a cutaway view of the engines, to visually describe the new units. Line drawings show how they serve as basic equipment for every major field of power. Ask for catalog BU-540. Also available is a four-pager—MS-1328—which the company's Construction Machinery Div. has prepared to tell about the operating and mechanical advantages of the 21000 engine as the power plant for its HD-21 turbocharged diesel crawler tractor. Illustrations include a cutaway of the "heart of a great new engine combustion system" responsible for providing more engine power from less fuel. Specifications of the 225-net hp engine are included.

Where to get: Allis-Chalmers Mfg. Co., Department EE, Milwaukee 1, Wis.

Subject: **Blasting Log**

Content: A blasting log published by the Associated General Contractors of America, is described as "the first uniform record book for blasting operations in construction." It provides contractors with a permanent record of each blasting operation. In the event of claims resulting from blasts, the contractor can use the log as a reference in connection with any seismographic records that may be available. The unique feature of the AGC blasting log is that for the first time it combines all material on blasting operations in one handy form. Each log contains 22 spreads that can be easily separated for use on separate jobs, and a sample spread is also included. The log maintains a permanent record of the type of formation blasted, depth of holes used for the charges, type and quantity of explosives, number and type of delays used, weather conditions under which shots were made, geographic location and time. Price is 20 cents per copy.

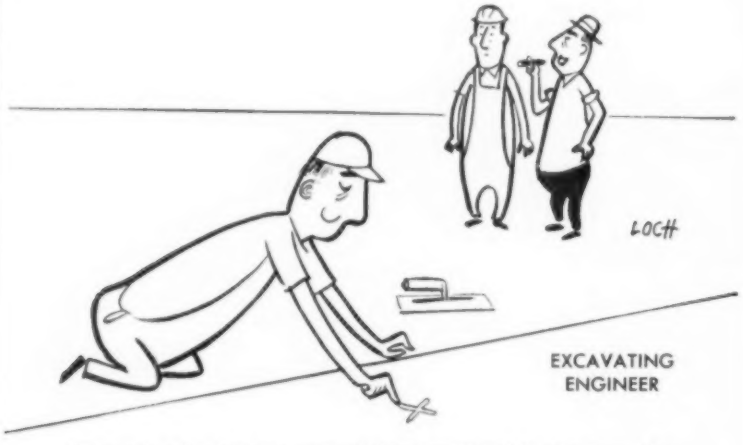
Where to get: Associated General Contractors of America, Inc., Department EE, 1957 E St. N.W., Washington 6, D. C.

New Movies . . .

Subject: **D9 Dozer**

Content: A 17-minute sound-color film reports on work being done by Cat D9 tractors throughout the United States. *Report on the Giant* shows the big dozer at work on tough jobs—bulldozing, ripping, pushing and skidding logs. During interviews filmed on these projects, job superintendents explain what their D9's are doing, why they chose them and what features of the 320-hp crawlers they consider important. Three men from Caterpillar drove 15,000 miles—from coast-to-coast and border-to-border of the nation—in three-and-a-half months to record the report on tape and film. Among the jobs covered are a California logging job, a Texas road-building project and a Massachusetts public utility firm.

Where to get: Caterpillar dealers or Caterpillar Tractor Co., Department EE, Peoria, Ill.



"Fulsprit Bwarflynutzkofizz is so proud of his cement work he signs every job—I'm so glad he doesn't know how to write!"

Notes from the Manufacturers

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Mussens Canada Limited, Montreal, Que., as a distributor for its products and for those of its subsidiary, Bucyrus-Erie Co. of Canada, Ltd., Guelph, Ont. The new distributor's territory includes the entire provinces of Quebec, New Brunswick and Nova Scotia and Prince Edward Island. Mussen's Canada Limited, Canada's oldest established equipment house and one of the largest distributors in the industry, has continuously served construction, mining, railroad and other customers for 57 years. Mussens Canada Limited will handle the complete line of ⅜ to 4-yd. excavators; Transit Cranes; Hydrocranes; 2½ to 8-yd. electric shovels and draglines; walking draglines up to 16-yd. capacity with diesel or electric power; dragline buckets; and cable tool and rotary blast hole drills. Six crane-excavators handled by the new distributor are being produced at Bucyrus-Erie Co. of Canada's new Guelph plant. Parts and servicing facilities are maintained at the distributor's plant, 65 Colborne St., Montreal 3, Que., and the following branches: P. O. Box 1071, Sept Isles, Que.; Queens Square, Fredericton, N. B.; 205 St. Sacrement Ave., Quebec, Que.; 702 Lariviere St., Rouyn, Que.; and 25 Bland St., Halifax, N. S.

LeTourneau-Westinghouse Co., Peoria, Ill., has appointed Toole Corp., 6615 Carson Ave., Seattle, Wash., as distributor for the complete line of L-W earthmoving, hauling and grading equipment in the state of Washington. The territory in which the firm will sell and service L-W equipment includes the following counties: Whatcom, Skagit, Chelan, Kittitas, Yakima, Snohomish, King, Pierce, Lewis, Pacific, Grays Harbor and Mason.

Eimco Corp., Salt Lake City, Utah, has authorized Janzen Equipment Co., Portland, Ore., as a distributor for the Eimco line of tractors, crawler-tractor units and air motors. Janzen is located at 1717 S. E. Third St. in Portland and will offer complete sales and service facilities. The firm is a partnership of Pete Janzen and his son, Norman. The Janzen firm will handle the complete Eimco tractor line, which includes dozers, excavators, excavator-dozer combinations, front-end loaders and fork lifts and the newly introduced Eimco 146 log loader, as well as Eimco air motors and locomotives.

Hercules Powder Co., Explosives Dept., Wilmington, Del., has named five new assistant district sales managers. The new appointees are: Robert E. Good, formerly assistant works manager, Bessemer, Ala., to assistant manager, Chicago (Ill.) office; William D. Cashin, sales serviceman, Pit Contractors' Div., to assistant manager, Joplin (Mo.) district; Allen T. Keel, sales serviceman, Pittsburgh (Pa.) district, to assistant manager, Birmingham (Ala.) district; Robert F. Kelleher, sales serviceman, Birmingham district, to assistant manager, Pittsburgh district; Robert N. Whisenant, special sales representative, Pittsburgh district, to assistant manager, San Francisco (Calif.) district.

Moretrench Corp., New York City, has moved its eastern district office from New York to 389 Main St., Hackensack, N. J. The firm had been located at 30 West St., for about 30 years. At the same time, American Dewatering Corp., an affiliated company, has transferred its principal office from 140 Cedar St., New York City, to the Moretrench main office and plant at Rockaway, N. J., and established a district office at the new Hackensack address. Both companies provide predrainage systems for construction projects. These moves are in keeping with a trend of many businesses selecting suburban locations to avoid urban congestion and provide better and more accessible service. For contractors and other companies who have New York City offices, both companies will continue the New York telephone number, COrtlandt 7-2283. Besides the new Hackensack and the Rockaway offices, both companies have district offices at Chicago, Ill., Tampa, Fla., and Houston, Tex.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters is all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

HEAVY EXCAVATION EQUIPMENT

Shovels—Cranes—Drills—Trucks

15-W Bucyrus-Erie Elec. Drag, 215', 13 yd.
9-W Bucyrus-Erie Elec. Drag, 160', 11½ yd.
7400 Marion Diesel Drag, 175', 13 yd.
7400 Marion Elec. Drag, 175', 12 yd.
625 Page Diesel Drag, 160', 9 yd.
360-M Marion Elec. Drag, 175', 8 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus-Erie Diesel Drag, 125', 6 yd.
5-W Bucyrus-Erie Diesel Drag, 100', 6 yd.
2400 Lima Dragline, 130', 5 yd.
4800 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5 yd.
3900, 3500 and 3000 Manitowoc Cranes
111-M Marion Drag, 100', 4 yd.
1601 Lima 4 yd. Shovel/Drag
1055 P&H Drag, 80', 3½ yd.
1201 Lima Dragline, 85', 3 yd.
54-B Bucyrus-Erie Drag, 80', 2½ yd.
5360 Marion 26 yard Elec. Shovel
750-B Bucyrus-Erie 20 yd. Elec. Shovel
1050-B Bucyrus-Erie 20 yd. Elec. Shovel
5480 Marion 18 yd. Elec. H. L. Shovel
151-M Marion 7 yd. Elec. Shovel
170-B Bucyrus-Erie 6½ yd. Elec. Shovel
4161 Marion 6 yd. Elec. Shovel
120-B Bucyrus-Erie 4 yd. Elec. Shovel
111-M Marion 4 yd. Standard Shovel
54-B Bucyrus-Erie 2½ yd. Standard Shovel
Large selection of smaller shovels and draglines available
Model T-750 Reich Truck-Mounted Rotary and Down-the-Hole Drill
Euclid Trucks—Rear and Bottom Dump
Truck Cranes, Dozers, Scrapers, Front End Loaders, Drills, Buckets, Attachments and other miscellaneous equipment available.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa. **GLadstone 5-3658**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

H-EQ-1 Hydrohoe; 18" wrist action type bucket, mechanical ejector—less hoist rams; sidecutters to cut 24"; HD 3¼" digging ram. New. Removed from H-3 #111124 in 1954. Price $2,100 F.O.B. Buffalo, N.Y.

Write: DOW & CO., INC.
Attn: H. E. Wildhack, Sales Mgr.
Buffalo, N. Y.

Unit 45 tagline reel complete with fittings, hose and guard for H-3 Hydrocrane. Good cond. Price: F.O.B. Minneapolis, Minn., $150.

THE ZECO CO.
2929 University Ave., S. E.
Minneapolis 14, Minn.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—51-B serial #62581 with D1700 2-yd. shovel and crane boom.
1—22-B serial #18844 gasoline engine, shovel, hoe and crane.
1—22-B Transit Machine on 1949 Dart Carrier, gasoline engine, crane, 30' boom.
1—Gradall, truck mounted, new in 1957, 24", 36" and 60" buckets available.
2—Michigan loader, model 175, 2½-yd., new in 1954, 1956.
1—Michigan loader, model 125A, 1⅝-yd., new in 1955.
1—Caterpillar model D7, 22" tracks, serial 4T2203, crank case guard starter, La Plant-Choate blade, new undercarriage, rebuilt motor.
1—Caterpillar model D2, 12" tracks, serial 4U2456, crank case guard starter, La Plant-Choate blade.
1—Austin Western sweeper, model 40, new condition.
1—Semi trailer, 25-ton Roger type H-25 D-56.

JAMES O'CONNEL & SONS, INC.
99 E. 236th St. **New York 70, N. Y.**
Phone: FAirbanks 4-0989

New sprag for H-3 Hydrocrane removed from Hydrohoe #93098. Price: F.O.B. Cleveland, Ohio, $50.

Mr. R. W. Casey
THE W. T. WALSH EQUIP. CO.
Cleveland 11, Ohio

1 Northwest 80-D shovel and dragline.
2 Northwest No. 8 draglines.
1 Marion 151-M 6-yd. shovel.
1 Marion 4161 dragline equipped with 120' boom and 5-yd. drag bucket.

EXCAVATING ENGINEER
Box 3744
South Milwaukee, Wis.

1—Lorain L820, serial number 22864, with D13000 engine serial number 4S12299, fairlead, shovel boom 23' long, 18' stick, 2-yd. AMSCO dipper, 70' crane boom, added air assist on crowd and retract clutches, bar gantry. Price F.O.B. Nashville, Tenn. $27,500.
1—Lorain TL-25 dragline and backhoe combination, serial number 21198, Cat D318 engine, long crawlers, 40' boom, fairleads, excellent condition. Price F.O.B. Nashville, Tenn. $11,500.
1—Lorain L-820 shovel serial number 14350 with Cat D13000 engine, fair condition. Price F.O.B. Nashville, Tenn. $7,500.
1—Bucyrus-Erie 11-B clamshell, dragline and hoe combination, serial number 119390, Continental F-186 gasoline engine, 35' pinned boom, pendant suspension, power steering, screw type outriggers, used one month. Price F.O.B. Nashville, Tenn. $17,500.
4—Euclid 60TD rear dumps, serial numbers 18317, 18318, 18319 and 18320, GM 6-110 engines, Fuller stick transmissions, ten forward and two reverse speeds, 22-ton standard bodies with three yard extensions. These units are only 2½ years old in excellent condition and guaranteed. Price F.O.B. Nashville, Tenn. $25,000 each.

EUCLID-TENNESSEE, INC.
220 Murfreesboro Road **P. O. Box 1176**
Nashville 2, Tenn.

Bucyrus-Erie model 10-B crawler diesel hoe and dragline, ¾-yd. cap., used only 1,260 hours.

THE ACME EQUIPMENT CO.
14057 Schaefer **VErmont 7-0366**
Detroit, Mich.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

1—Michigan C-16, ½-cu. yd. hoe, ½-yd. 22" bucket, 9'-9" crawlers, 20" wide, Hercules gas engine JXD #1742230, machine #3797, 4-years old.
1—Koehring 303—¾-cu. yd. hoe, 30" bucket, 10'-6" crawlers, 24" wide, Waukesha gas engine #484150, 4⅝" x 5¼", serial #2337.
1—Worthington 16-S concrete mixer on 4 pneumatic tires with power skip and water tank, serial #5548 powered by Wisconsin VF-4 gas engine, 4 years old.
1—Osgood 200—½-yd. hoe with 22" bucket, 11' crawlers, 22" wide, powered by Continental gas engine, machine #6285, 5 years old.
1—International TD-14 crawler loader model 14K3 with Drott Skid-Shovel, 2½-yd., serial #B-2463, only 1½ years old, excellent shape, 1,500 hours.
1—Bucyrus-Erie 15-B hoe attachment with ½-yd. bucket, 34" wide with side cutter straight boom—like new.
1—Bucyrus-Erie 15-B ½-yd. shovel attachment—perfect.
1—Wiley PM215 Patchmobile portable asphalt patching unit on two pneumatic tires, complete with rotary dryer. This unit is new.
1—Ruhr M 1½-cu. yd. heavy-duty grapple, new, excellent buy.
1—Wayne 36" rider industrial vacuum pick-up power sweeper, demonstrator, 2 years old.
1—LeRoi 315 air compressor on 4 pneumatic tires, 7 or 8 years old.
2—CMC Jeteretes with all accessories. Excellent condition, practically new with all extra accessories.
1—Baker 3,300-gallon bulk tank trailer, single axle.
1—Ross 6 ton-pneumatic tires fork lift truck, 10' mast, 14' lift.
1—Bucyrus-Erie 15-B positive crowd shovel, 15'-6" boom, 12'-6" handle, ½-yd. cast iron dipper including dragline and clamshell equipment consisting of 30' boom, complete dragline equipment, also tagline equipment with rope, closing and lowering ropes, drum lagging, no clamshell bucket or drag bucket included. Fully enclosed steel cab, independent power boom hoist, 20" wide treads, Buda 6 cylinder 3½" x 4¼" HP-326 gasoline engine with electric starter, 2,900# cast iron ballast, serial #51572.
1—Used Kennedy Van-Saun revolving scrubber washer screen, 48" dia. x 21'-0" long, in excellent shape and complete with all new parts including extra scrubber sections and new sizing screens.
2—Insley type L, ¾-yd. hoe, GM series 3-71 diesel engines. Serial #7590 and 7009. Good condition.
1—Bucyrus-Erie 20-B ¾-yd. positive crowd shovel, powered by 40-hp electric motor.

S. M. Christhilf & Son, Inc.
Timonium Road & Harrisburg Expressway
Timonium Md. **VAlley 5-5100**

Lorain mdl. TL25, serial #19697, ¾-yd. combination hoe and shovel, Waukesha gas engine, standard crawlers, 22" treads, completely reconditioned. $10,500.
Insley crawler mounted hoe, type "K", 24" bucket, standard crawlers, serial #6923, Waukesha gas engine, year 1955. Excellent value. $7,850.
Lorain mdl. L40, serial #15639, combination shovel, hoe, 50' crane boom with fairlead and Rudomatic tagline. Fair condition. $5,000.
Bucyrus-Erie Hydrohoe attachment for H-3 Hydrocrane complete with 18" general purpose dipper, 20" utility dipper and all necessary fittings. Very good condition. $1,000.

Binder Machinery Co.
Brighton Street, Union, N. J.
MUrdock 8-0060

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

TRUCK CRANES

Lima 44T truck crane, 25-ton clamshell and lifting crane, 80' boom, 30' jib Rudomatic tagline, Dart carrier, 9' wide, 10—12:00 x 24 14-ply tires, Waukesha, very good condition, 30-day guarantee, $30,000.

Lima Paymaster truck crane, type E34, ¾-yd., 35' boom, 6-cylinder Buda gas engine, mounted on Mack 6x6 truck carrier with ten 12:00 x 24:00 tires. $12,500.

SHOVELS

Northwest model 80-D, 2½-yd. shovel with 30" tracks, 25' boom, 22'6" dipper, powered by a Murphy diesel engine. As inspected. $39,500.

Link-Belt Speeder, mod. LS85, ¾-yd. capacity, 50' boom, 2-sheave boom point, 20" pads, powered by Cat D318 diesel engine. Subject to inspection. $5,500.

SHOVEL ATTACHMENT

Bucyrus-Erie tunnel shovel attachment for a 22-B consisting of 14' boom, 12'-10" stick, 1-cu. yd. rock dipper, crowd drum, sprocket and crowd chain. Excellent condition. $3,500.

SCRAPER

Bucyrus-Erie model B-170 scraper (18¾-yd. capacity) with 21:00 x 25 twenty ply tires all around. Excellent condition. $7,500.

TRACTOR

Caterpillar model D8, direct drive, diesel tractor, 14A series, with 24" tracks, crankcase guard, electric starter, oil clutch, pull hook, canopy top, w/Caterpillar 8S straight bulldozer blade and Caterpillar No. 25 D.D.P.C.U. Reconditioned. 30-day Bonded Guarantee. $25,000.

LOADER

Caterpillar No. 977 Traxcavator, with 18" triple grouser tracks, full crankcase guard, oil clutch and a general purpose bucket 2¼-yd. with teeth. Reconditioned. 30-day Bonded Guarantee, $18,500.

TRENCHER

Cleveland No. 95 trencher, option 5, 16" buckets, 21½" cut, 10" tracks, powered by a Continental gas engine. Trencher reconditioned. 30-day guarantee, $6,600.

H. O. PENN MACH. CO., INC.
140th St. & East River
New York 54, N. Y.

Lorain, model 820, 1948, with 2-yd. bucket and shovel front. Good condition. F.O.B. Detroit, Mich. $19,500.

Lorain, model TL-25, 1954, with ¾-yd. backhoe, 35-ft. boom and fairlead. Excellent condition. F.O.B. Detroit, Mich. $14,500.

Lorain, model TL-15, 1955, with hoe. F.O.B. Detroit, Mich. $8,500.

Link-Belt crane, model 480, serial 1877. Will sell for parts. F.O.B. Detroit, Mich. $3,500.

Bay City, model 45, 1952, with hoe, GM 3-71 engine. Excellent condition. F.O.B. Detroit, Mich. $16,000.

Contact: Wolverine Tractor & Equipment Co.
25900 W. 8 Mile Road
Detroit, 19, Mich. KEnwood 4-8400

1—P&H 705 dragline, 2-yd. w/55' boom.
1—Northwest model 25 hoe.
1—Model H Scoopmobile, hydraulic loader, ¾-yd. 1955 model, excellent condition.
1—12-ton single-axle trailer (7:50 x 20 tires, new) air brakes new.
1—Model C Scoopmobile 22' tower, pallet fork or bucket, excellent condition.
1—Model 41 Loram ¾-yd. crane with Cat D4600 engine, 1945 model, 45' boom, track type.
1—Model 10-20 Unit crane mounted on Dart truck, excellent.
2—365-cu. ft. Gardner-Denver air compressors. Good.
1—1½-yd. Kiesler clamshell bucket-rehandling. Like new.
1—HD-20 Allis-Chalmers with push plate.
1—Model 300 International utility tractor with Wain-Roy backhoe, 1956 models, both in very good condition.
1—Model 12 Caterpillar motor patrol, large front wheels, fair condition.
1—YR-13 LeTourneau scraper working condition.
1—Esco ¾-yd. orange-peel bucket. Excellent.
1—K-12 Insley dragline, 1955 model, good condition. Located our branch, Springfield, Mo.
1—Caterpillar 25 DDPCU—Excellent.
1—Shovel front for Bucyrus-Erie 22-B. Good throughout.
1—365-cu. ft. LeRoi air compressor, 1956 model, P&H diesel engine.

Contractors Supply
620 E. 18th St.
Kansas City, Mo.

⅜-yd. model 10-B Bucyrus-Erie shovel (1949); Hercules gas engine. Good working condition. Available immediately. $5,000 our yard, Milwaukee, Wis.

⅜-yd. model H-3 Bucyrus-Erie Hydrocrane (1952) mounted on Ford F-600 truck chassis; equipped with steel operator's cab, tagline reel, clamshell bucket. Very good condition.

⅜-yd. model H-3 Bucyrus-Erie Hydrocrane (1950) mounted on IHC A-162 truck chassis equipped with tagline reel, clam bucket.

⅜-yd. model H-3 Bucyrus-Erie Hydrocrane (1953) mounted on 1953 Ford F-600 truck chassis, complete with 2-piece telescopic boom, tandem outriggers, operator's cab with heater, tagline reel, hydraulic clamshell bucket. Overhauled and repainted. In excellent condition.

½-yd. model 514 Unit backhoe, Chrysler gas engine and ½-yd. dipper—$4,500.

¾-yd. model 375 American crawler shovel with Waukesha gas power. New 1949. Priced at $3,750.

¾-yd. model 22-B Bucyrus-Erie crawler shovel dragline, equipped with Cat D318 diesel engine, 12' standard crawlers, 40' boom, fairlead. In good condition.

¾-yd. model 375 American crawler-mounted dragline, long crawlers, fairlead. Series 3-71 GMC diesel engine.

1-yd. model 455 P&H crawler crane-clam-dragline machine with 75' boom, 15' jib; Chrysler 8-cylinder gas engine. In excellent condition. F.O.B. Milwaukee.

1½-yd. model 604 Lima crane-dragline machine, new in 1951, with Cummins diesel engine, 80' boom and fairlead. Overhauled and repainted. In very good condition.

2-yd. model 820 Lorain crane-clam-dragline equipped w/Cat D13000 diesel, swamp cats, 90' flange-type boom, fairlead, tagline reel, pressure lubrication system. In excellent condition.

15-ton Bay City truck crane in good condition. Priced to sell. Unit should be seen to be appreciated.

35-ton model 30-B Bucyrus-Erie transit crane demonstrator. Save $20,000. Equipped with 130' boom, GMC diesel 4-71 on crane, Waukesha gas power on carrier. New machine warranty.

Dredge Portable all-steel barge-mounted dredge, 18" x 56' barge. Knocks down to 4 sections. 5-drum dredge hoist. Model 600 Cummins diesel engine on 10" Amsco pump. 4-71 GMC diesel-operated generator and high pressure water pump. 36' ladder with rotary cutter. 1500 ft. of 10" pipe—more available. Rebuilt and guaranteed. $37,500 at La Crosse, Wis. A real good buy!

Gradall multi purpose machine model M2460 with GM diesel engine; mounted on 6 x 4 carrier having 4 wheel tandem drive; equipped with 36" heavy duty bucket and single tooth heavy duty ripper—new 1957. Good buy at $17,500.

Gradall model 2400 powered with IHC 4-cylinder gas engine, mounted on IHC RF190 tandem rear axle truck equipped with standard boom 36" digging bucket, 24" digging bucket with ESCO teeth. Priced at $8,500.

J. P. WAITE, INC.
3304 W. Pierce St. P. O. Box 313
Milwaukee 1, Wis. EV. 4-1900

Austin Western Badger shovel and backhoe, S/N 3386, powered by IHC UD-9 diesel engine. In fairly good operating condition. F.O.B. Idaho Falls. $3,650.

Bucyrus-Erie crowd shovel attachment for model 15-B, ½-yd., excavator. Very good condition. U-197. $1,950.

Bucyrus-Erie dragline boom for 15-B, two 15-ft. sections. Good condition. U-51. $1,050.

Dragline bucket for Bucyrus-Erie 15-B, ½-yd. capacity. Good condition. U-142. $300.

Northwest model 25, ¾-yd. shovel, dragline, and hoe. 40' crane boom and cambered type hoe boom. 30" track shoes. S/N 16806. This late 1955 machine is in excellent condition and guaranteed. U-130 $17,500.

Northwest crowd shovel attachment for model 25, ¾-yd. New and unused. U-198. $1,950.

Unit model 10-20 backhoe, includes crowd shovel, dragline, dragline bucket and clamshell bucket. S/N 1719. Complete with extra engine and spare parts; engine overhauled. Good condition. U-249 $7,950. F.O.B. Idaho Falls, Idaho.

Link-Belt Speeder model LS-52 with 2 front ends—25' dragline and crane boom and crowd shovel. Powered by Cat D315 diesel. Very good condition. U-276. $10,750.

Wellman 2½-yd. dragline bucket, model DXL, S/N D-1789. Has never been used. $1,200.

Call, wire or write today for information about these and our many other items of used equipment.

LANG CONSTRUCTION EQUIP. CO.
P. O. Box 1646 Salt Lake City, Utah
Phone: DAvis 2-1241 TWX No. SU-278

38-B Bucyrus-Erie 1½-yd. shovel #85914 with Caterpillar diesel engine, 33" wide treads. Located in Seattle. Excellent condition. Specially priced.
38-B Bucyrus-Erie shovel attachment.
15-B Bucyrus-Erie shovel, 16" tracks. Serial #27509. Continental gas engine.
15-B Bucyrus-Erie combination 40-10 hoe. Buda HP-351 gas engine. Serial No. 55089. Good condition except tracks considerably worn.
Model 25 Northwest diesel shovel and pull shovel, GMC diesel engine. Serial #7723. Located in Seattle.
Model L-41 Lorain hoe with Waukesha gas engine. Serial No. 17832.

Clyde Equipment Co.
3410 First Ave. So.
Seattle 4, Wash.

MISCELLANEOUS EQUIPMENT

1—Allis-Chalmers HD-21, serial HD21A7638, equipped with Garwood angledozer, and Garwood double drum winch. New grousers with running gear approximately 75% good. New end bits, cutting edges and battery. Cleaned and repainted. 2,204 hours since new. Price, F.O.B. car, Kalispell, Mont. $16,000.

1—Allis-Chalmers HD-21, serial HD21A7479, equipped with Garwood angledozer and Garwood double drum winch. Checked over and appears to be in good operating condition. Tracks and running gear approximately 50% good. Engine rebuilt 700 hours ago. Machine has had 3,900 hours since new. Price, F.O.B. car, Missoula, Mont. $10,500.

1—Allis-Chalmers HD-21, serial HD21A-8816L, equipped with hydraulic angledozer, Preco backrippers, Carco model T towing winch, guarded up and includes overhead operator guard. Tracks, rollers and idlers should be rebuilt. Engine, transmission, and final drives have been recently overhauled. 2,300 hours since new. Price, F.O.B. Missoula, Mont. on car $8,500.

2—Allis-Chalmers HD-20 tractors, equipped with Caterpillar No. 25 cable control and push blocks. Tracks, rollers and idlers should be rebuilt. Price, F.O.B. car, Missoula, Mont. $4,000 ea.

1—International TD-18, serial TD18-236777, new in 1956, has had 2,601 hours use. Engine uses 1½ gal. oil per week. Equipped with hydraulic angledozer and Isaacson towing winch. Guard up, with overhead operator guard. Rollers, links, and sprockets need rebuilding, and one of the steering clutch pinions has a tooth missing. Grousers 75% good. Price, F.O.B. car, Missoula, Mont. "As is" $4,500.

Westmont Tractor Co.
Box 1445 Missoula, Mont.
Phone Lincoln 3-6666

FOR SALE

3—29-T Bucyrus-Erie wire line blast hole drills.

2—42-T Bucyrus-Erie wire line blast hole drills.

1—Traylor model TZ gyratory crusher.

1—Model 80 diesel-powered Haiss loader.

1—Model 80W gas-powered Haiss loader.

NEW YORK TRAP ROCK CORP.
Old Mill Road
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Telephone—NYack 7-1500

MISCELLANEOUS EQUIPMENT

TRACTORS

1—Caterpillar D8 13A series equipped with roller guards, electric system and Cat 25 power unit. This machine was reconditioned just before we took it in trade.

1—HD11G Allis-Chalmers model TS-11 tractor-shovel 2-yd. front end loader, and model 9800 ripper. This machine has very low hours. Located at Casper, Wyo. branch.

1—HD5B Allis-Chalmers equipped with Garwood hydraulic dozer. This machine has been well maintained. Don't overlook it if you are in the market for a clean tractor.

EXCAVATORS

1—Bucyrus-Erie 38-B powered by General Motors engine, equipped with torque converter and shovel attachment. A very clean piece of machinery.

1—P&H crane mounted on 12 wheel Maxi carrier powered by Waukesha gas engine, 60' boom. This machine is ideal for industrial application.

1—Koehring model 304 S/N 8204, equipped as a shovel—machine is in good operating condition. Located at Casper, Wyo. branch.

ASPHALT EQUIPMENT

1—848 Barber Greene asphalt plant, equipped with feeder, bucket elevators, rotary drier, gradation unit, dust collector, pug mill, Cleaver Brooks steam boiler, GM model 4-71 engine, Caterpillar model D13000 engines, also electric motors, wiring cables and panels that make this plant complete. We welcome inspections of this plant.

SCRAPERS AND TRUCKS

2—Caterpillar model DW20 scrapers 24.00 x 29 rear tires. These machines have been rebuilt in our shops. The tires are above average.

3—Koehring WD60 Dumptors, 18.00 x 24 drive tires, 10.00 x 20 steering tires. Serial numbers D3051, D3867, D4202, D4550 and D4551. On inspection you will agree that these machines are above average.

THE COLORADO BUILDERS' SUPPLY CO.
1534 Blake St.
Denver 2, Colo.

Adnun blacktop paver, S/N 1462. Has been repaired and is in good operating condition. U-5. $1,400.

Barber-Greene model 879-A asphalt finisher, S/N 49-67. Powered by LeRoi gas engine. Has been completely rebuilt and is in excellent condition. U-170. $9,200.

Barber-Greene trencher with 5" cutting bits. Wisconsin gas engine. U-372. Bargain price $3,750.

Carco model "J" logging winch, 1955 model, good as new. U-65. Only $2,100.

Cleveland wheel ditcher, "Baby Digger." S/N 306. Powered by Hercules gas engine. Has 4½-ft. digging depth. Good working condition. U-1. $1,450.

Bege ST-770 hydraulic scraper, 6-yds. struck capacity. Excellent condition. U-246. $3,200.

Fruehauf trailer (remodeled Army surplus) Good condition. U-28. $1,250.

Galion 8-12 ton tandem roller, S/N 10741, with Hercules gasoline engine. Has been overhauled in our shop. U-283. $4,215.

Gardner-Denver Air Trac model AT, complete with DH-123J deep hole drill with 1½" lock-in chuck. Includes two RMC 12' chain feed for 12" sectional drill rods. Only 3 months use. U-346. $9,500.

Joy heavy weight class 58-BH 3⅝" blast hole drill, 1951 model. Bargain price. Inquire for further details.

International Payscraper model 2T-75, 55,000 lb. rated capacity and wide base tires. Excellent condition. U-135. $29,500.

Bucyrus-Erie model CR-3 tractor-drawn cable operated ripper, excellent condition, F.O.B. Idaho Falls, Idaho. U-250. $1,050.

Parsons model 88 trench liner has 7" paddles on chains, 14" paddles on extra chain. Gas engine. Good condition. F.O.B. Idaho Falls, Idaho. U-373. $6,250.

Superior pipe tongs as good as new. U-176. $99.50.

Call, wire, or write today for information about these and our many other items of used equipment.

LANG CONSTRUCTION EQUIP. CO.
P. O. Box 1646 **Salt Lake City, Utah**
Phone: DAvis 2-1241 **TWX No. SU-278**

Model 25 Northwest shovel front—new $3,000.

E. J. Knepfle's Sons
520 Riverside Dr.
Newport, Ky. **CO. 1-3035**

Caterpillar model D8 diesel tractor, serial 2U-20641SP, equipped with Gardner Denver model WH600 tractor mounted compressor, Gardner Denver model JMA hydraulic pump, Gardner Denver model JTB tripod-type boom, two (2) Gardner Denver model D99DT derrick type drill, Gardner Denver chain feed mountings, with 7" cone for 12-ft. steel changes, electric starting, crankcase guard, dry type air cleaner. Machine is in excellent condition. $24,500.

Caterpillar model D8 diesel tractor, serial 13A-997, equipped with Caterpillar model 8U Universal cable controlled bulldozer, Caterpillar model 25 rear mounted double drum cable control unit, electric starting, lights, crankcase guard, track roller guards, oil clutch, dry type air cleaner. Tractor in excellent condition. $19,500.

Caterpillar model D7 diesel tractor, serial 3T-16033, equipped with Caterpillar model 7A angle blade bulldozer, Caterpillar model 24 front mounted single drum cable control, 20" grouser tracks, electric starting, track roller guards, dry type air cleaner. This machine is in good condition. $15,500.

Caterpillar model D6 60" diesel tractor, serial 8U-9277, equipped with Caterpillar model 6-S hydraulic controlled bulldozer, Caterpillar model 46 front mounted hydraulic control, crankcase guard, lights, electric starting, oil type flywheel clutch. Machine in good condition. $14,500.

Caterpillar model D4 60" diesel tractor, serial 7U-4475, equipped with straight blade bulldozer, BeGe rear mounted hydraulic control. Tractor is in fair condition. $3,750.

Allis-Chalmers model HD-21A torque converter, diesel tractor, serial No. HD21A-8528, equipped with Gar Wood model 281 rear mounted double drum cable control unit. Gar Wood straight blade bulldozer, roller guards, crankcase guard, lights, 26" grouser tracks. Good condition. $17,500.

Essick model 490 tandem road roller, serial 590089, powered by Wisconsin model VE4 air cooled gasoline engine, complete with scraper bars, water system. Fair condition. $400.

Caterpillar model D6 74" diesel tractor, serial 9U-371, equipped with 6-roller non-oscillating track frame, large front idlers, 16" wide grouser tracks, Caterpillar model 46 front mounted hydraulic control unit. Trackson model AF-6 hydraulic angling blade bulldozer, Trackson model MD-6 pipelayer, complete with 14' boom and snatch block. Very good condition. $12,500.

Caterpillar model D8 diesel tractor, serial No. 2U-9403, equipped with Trackson model MD-8 pipelayer, counterweights, crankcase guard. Tractor in fair condition. $9,500.

Caterpillar model D8 diesel tractor, serial No. 2U-6546, equipped with Trackson model MD-8 pipelayer, crankcase guard, electric starting. Tractor in fair condition. Location: Dodge City, Kan. $9,500.

Caterpillar model D8 diesel tractor, serial No. 2U-7940, equipped with Trackson model MD-8 pipelayer, electric starting, counterweights, crankcase guard. Location: Dodge City, Kan. $9,500.

Caterpillar model D8 diesel tractor, serial No. 2U-4875, equipped with Trackson model MD-8 pipelayer, counterweights, electric starting, crankcase guard. Machine in fair condition. Location: Dodge City, Kan. $9,500.

Caterpillar model D353 diesel electric set, serial 46B-523, 200-KW, 240/480-volt, 3-phase, 60-cycle, 1,200 rpm generator, equipped with radiator, blower fan, for 110° F. max. amb., air temperature, 2L-9626 base and fuel tank, 3L-5990 safety device, 1L-6100 electric starting for 2L-9042 gasoline starting system, 2L-6805 charging generator. Excellent condition. $16,500.

Caterpillar model D337, series F, diesel electric set, serial 37B-1519, equipped with 150-KW, 3-phase, 60-cycle, 1,800 rpm, generator, 2L-7218 gasoline starting system, 2L-6941 skid base and fuel tank, 3L-684 oil pressure and water temperature shut off control, 2L-346 generator, 2L-9193 installation group. 1L-9521 vernier control, 1L-9817 governor, 1L-8966 radiator, 1L-8911 blower fan. Good condition. $9,500.

Gardner-Denver model WBK-2001 "500" portable air compressor, serial No. 130890, powered by Caterpillar model D13000 diesel engine, serial No. 4S-7304, all mounted on International truck with tandem axle. Fair to good condition. $7,500.

Gardner-Denver Air Trac Carrier, serial No. 1426, equipped with RMC-10 chain feed, serial No. 221894, and Gardner-Denver model DH99J deep hole drill, serial 618, air hoses and towing tongue. Good condition. $7,500.

R. L. Harrison Co., Inc.
1801 4th St. N.W. **P. O. Box 1326**
Albuquerque, N. M.

TWO DRUM HOIST

American Hoist & Derrick model 100 double drum band friction hoist with boom swinger. Powered by Minneapolis Moline 4-cylinder 4⅝" x 6" gasoline engine developing 61 net HP @ 1,200 rpm. Engine equipped with electric starter and Twin Disc master clutch. Drive from engine to machinery through totally enclosed silent chain to ball bearing countershaft. Hoist drums 16" dia. by 26" long with 28" dia. flanges. Drums driven through manually operated external contracting band clutches and controlled by foot operated external contracting band type brakes. Drums suitable for either ⅝" or ¾" dia. wire rope. Spooling capacity 2,000' to 3,000' depending on diameter. Hoist develops 9,000# single line pull at 120 fpm on two hoisting drums and 6,000# single line pull @ 30 fpm for boom swinger. Skid mounted. Approximately 12,000#.

BUCYRUS-ERIE CO.
South Milwaukee, Wis.
J. E. Smart **SO 2-0900**

New—⅞-cu. yd. type "BM" medium duty dragline buckets complete with all fittings. Weight—1,900 pounds each. Reduced price—$1,140 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE
South Milwaukee, Wis.

1—Reconditioned—⅞-cu. yd. type "BM" medium-duty dragline bucket complete with all fittings. Weight—1,750#. Special reduced price $900. F.O.B. Evansville, Ind. John T. Aspel.

BUCYRUS-ERIE CO.
South Milwaukee, Wis.

3—¾-cu. yd. type AX medium-duty dragline buckets. Complete with all fittings. Weight—950 lbs. ea. Reduced price—$620 ea. F.O.B. Evansville, Ind.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wis.

Portable, all steel barge-mounted dredge, 18' x 56' barge, knocks down to 4 sections, 5 drum dredge hoist, model 600 Cummins diesel on 10" AMSCO pump. G-M 4-71 diesel operates generator and high pressure water pump. 36' ladder with rotary cutter. 1,500' of 10" pipe—more available. Rebuilt and guaranteed. Financing available. $37,500. Call:

J. P. WAITE, INC.
3304 W. Pierce St. **Milwaukee, Wis.**
EVergreen 4-1900

2—Joy 58BH rotary blast hole drills. 440-volt, 3-phase, 60-cycle electrical equipment. Both machines bought new 1951. Tools and spare parts available.

EXCAVATING ENGINEER
Box 3743
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P&H model 255A, ¾-yd. shovel with Cat D315 diesel engine. 1955 model. S/N 6827. $12,000 F.O.B. Elizabethtown, Ky.

Unit ¾-yd. shovel with GM 3-71 diesel engine. S/N 47667 $5,000 F.O.B. Elizabethtown, Ky.

Two shovel fronts complete with Koehring model 304, ¾-yd. Like new condition. $1,950 (each) F.O.B. Louisville, Ky.

Three Barber-Greene finishers model 879-A F.O.B. Louisville, Ky. $9,300, $7,500, $7,500.

Write—Wire or Phone Jim Waddell
Brandeis Machinery & Supply Co.
P. O. Box 1705 **MElrose 7-4741**
Louisville 1, Ky.

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1 Model TD-6 International tractor dozer shovel, with Bucyrus-Erie front end loader, serial #50345. Price $1,500.

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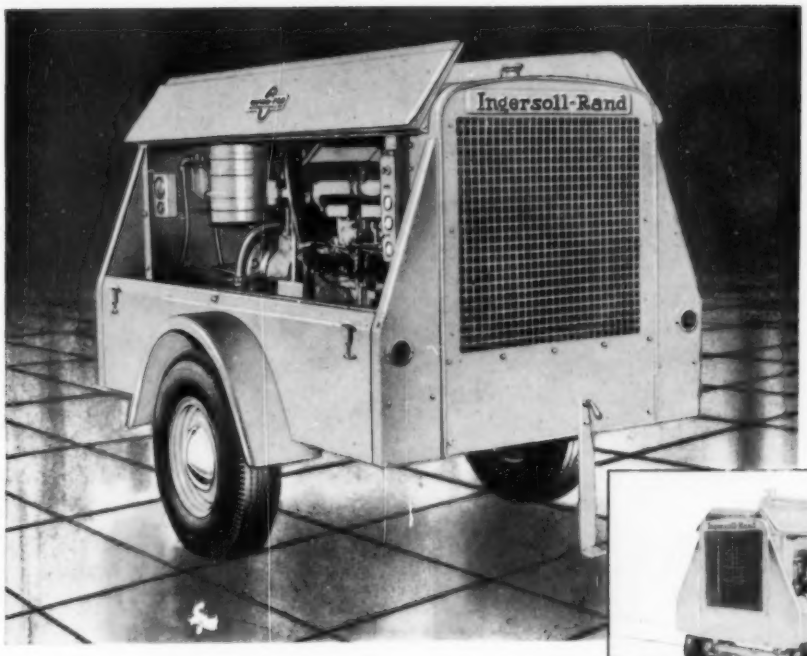

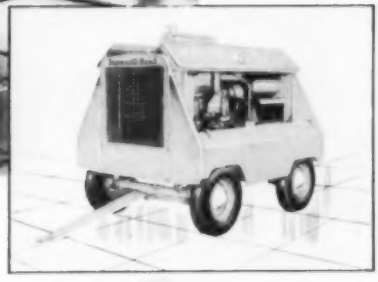

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NEW SIZE...250 cfm GYRO-FLO

Ingersoll-Rand's advanced design
ROTARY AIR COMPRESSOR

Ingersoll-Rand, the pioneer builder of portable rotary compressors, now offers a new size Gyro-Flo—the R-250 with a completely new, simplified compressor system.

The new Gyro-Flo 250 offers nearly 20% more capacity in a unit that is smaller and more compact than its predecessor—the Gyro-Flo 210. It is driven by larger, more-powerful engines—yet retains the same 1800 rpm engine speed. Fuel and air tanks are under housing and lockable cover...Full-length tool boxes give more storage space...There's provision for easy inspection of all rotor vanes...Side covers fold back safely out-of-way...And 12-volt battery system permits fast starting. These are just a few of the features of the new R-250.

The Gyro-Flo 250 gives you a choice of two compressor-matched drives—the *new* General Motors 4-53 diesel engine or the Continental M-363 gasoline engine. Available with 2- or 4-wheel mounting, or without running-gear. Ask your Ingersoll-Rand representative for complete information, or send today for Bulletin 2931.

DIMENSIONS AND WEIGHT

4-Wheel Mounting	G.	D.
Weight (wet)	4425	4610
Length (less drawbar)	8'-10½"	8'-10½"
Width	5'-9½"	5'-9½"
Height	6'-1"	6'8⅝"
2-Wheel Mounting		
Weight (wet)	4390	4575
Length (incl. dr'wbar)	12'-5"	12'-5"
Width	5'-11"	5'-11"
Height	6'-0⅝"	6'-8½"
Less Running Gear (Incl. Shipping Skid)		
Weight (wet)	3879	4064
Length	7'-8½"	7'-8½"
Width	3'-2"	3'-2"
Height	4'-5"	5'-9"

Ingersoll-Rand
2-945
11 Broadway, New York 4, N.Y.

AN UNBEATABLE COMBINATION...GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

No. 955 excavates part of a total of 19,000 yd., preparing for base an area 20 ft. wide, 12-13 in. deep. Cuts are made by Cat No. 12 Motor Grader and windrowed. Job is part of a $1,828,366 project by Gulf Bitulithic Co. on U. S. 75, to be part of the Interstate Highway System.

Weather bad... No. 955 terrific... job on schedule!

Bad weather cut work days during the first six months to 20 per cent, but the highway project stayed on schedule. Reason: a Caterpillar No. 955 Traxcavator with Side Dump Bucket.

Gulf Bitulithic Co., Houston, Texas, first tried a drag line on a 2½-mile widening job on U.S. 75 at Conroe, Texas. Production was poor in the shallow cut. Switching to a No. 955, five-yd. trucks were loaded in an average time of three minutes: four buckets to the truck.

"We increased production 25 per cent," says Superintendent Thomas "Red" Brown. "I like that Side Dump Bucket. You can't beat it!"

In-line loading of trucks with the Side Dump Bucket paid off in less traffic congestion on the busy highway, and it also avoided tearing up the subgrade with twisting and turning.

Says Operator F. H. Leggett: "I can move over 100 cu. yd. a day more with the side dump than with other loaders. It doesn't spill dirt because you don't have to jockey for position. A Traxcavator is easy to operate and I'm less tired at night. It's the best on the market."

Side Dump Buckets are available on all three Traxcavators: No. 977 (2¼ cu. yd.), No. 955 (1⅝ cu. yd.) and No. 933 (1⅛ cu. yd.). Other buckets, teeth, 'dozers and forks help make a Traxcavator the most versatile excavator-loader.

Ask your Caterpillar Dealer to demonstrate on *your* job how a Traxcavator can make money for you. He stands behind every machine he sells with round-the-clock service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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